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SEPTEMBER 14, 1935

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Railway Age

FOUNDED IN 1856

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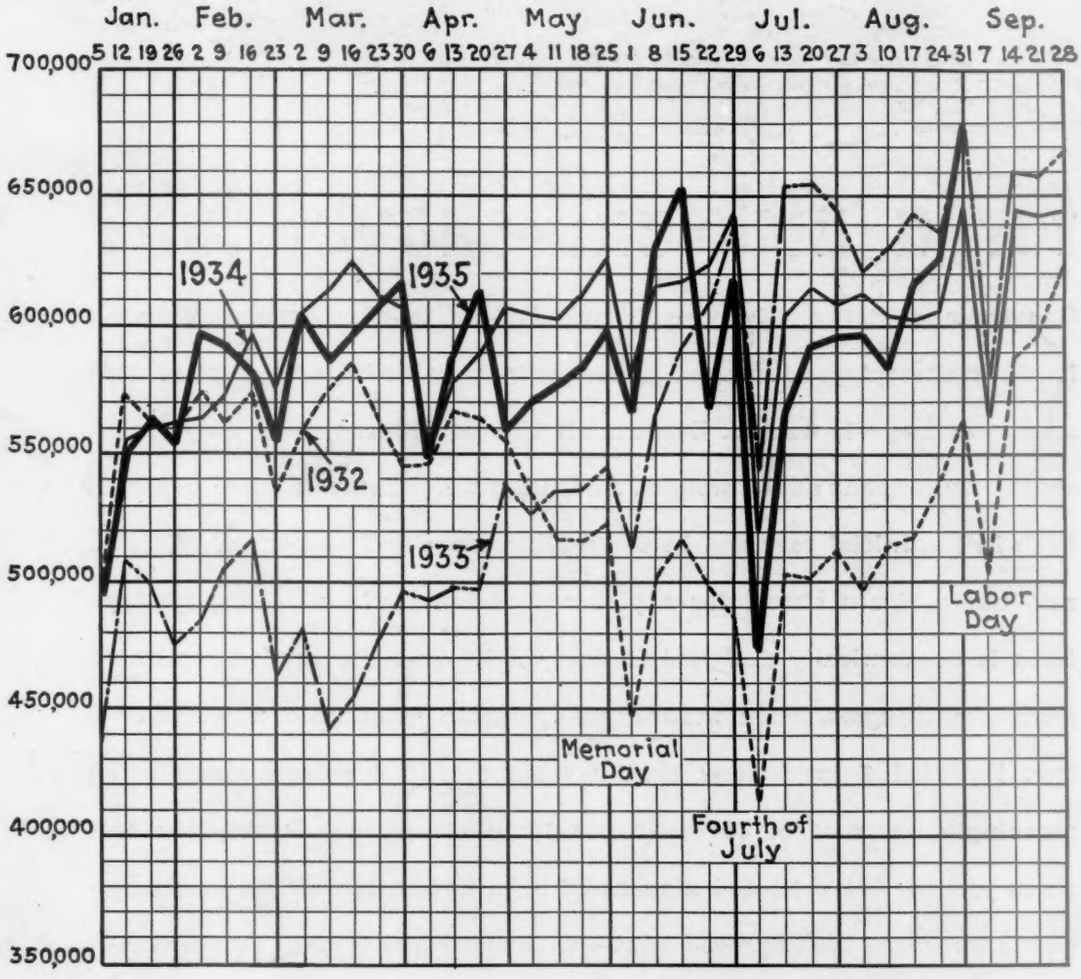
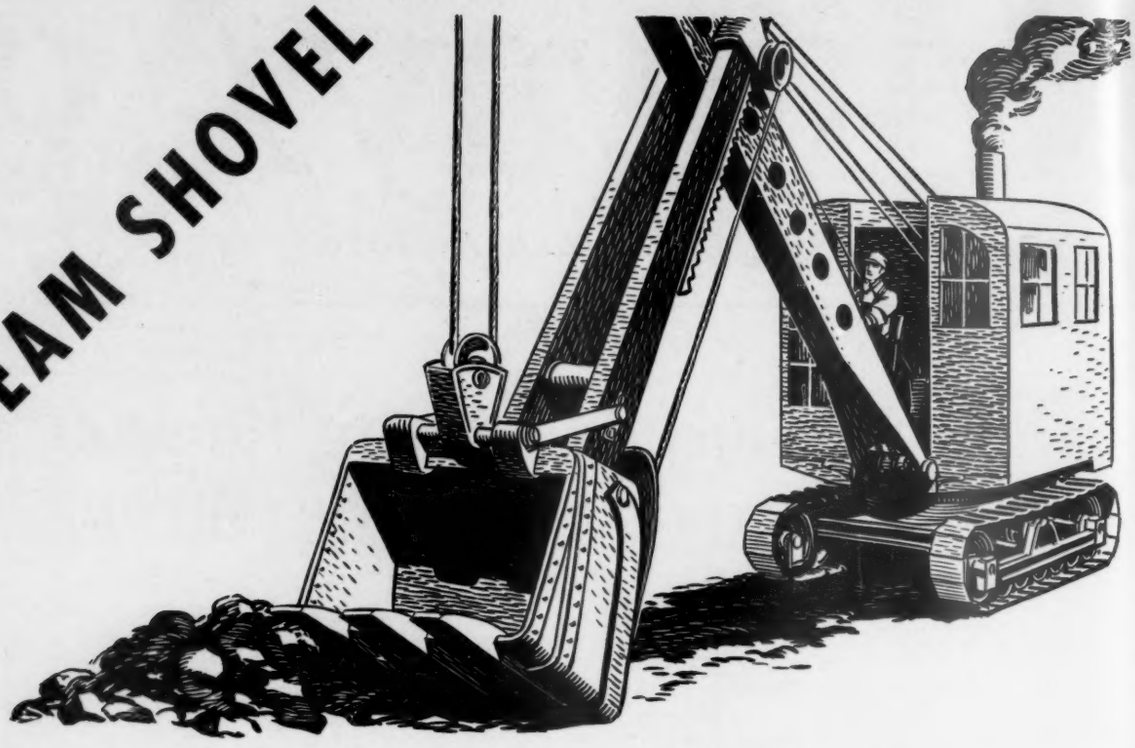
Freight Traffic Level Up 96,000 Cars in Period of Three Weeks



That improvement in freight traffic can come with great rapidity was borne out by the rise of over 96,000 cars in the level of revenue freight loadings during the last three weeks in August — with loadings in the week of August 31 reaching the highest peak since November 14, 1931.

Continuing traffic improvement compared with that of recent years will test the ability of railway equipment to render a high standard of service, and will multiply the opportunities for operating economy and greater net income through the acquisition of new equipment.

A STEAM SHOVEL



for a pick-and-shovel job?

Conventional steam railway equipment is built to carry tremendous peak loads. In these days of reduced passenger traffic, this reserve—once considered necessary—is wasted. Because all this equipment, used only for an emergency, means added weight. And more weight means more expense, both in the initial cost and in the maintenance and operation. Why, we ask, use a steam shovel for a pick-and-shovel job? • A Zephyr-type train is economically designed to carry a load on the revenue collected from 17 passengers. Maintenance and operation costs are correspondingly low. Railroad figures show that a train of this type operates on the amazingly low cost of 34 cents per train mile. • During the last three years we've collected a mass of information about the passenger-traffic business. We've proved that—with the right type of equipment—there's a profit in it. We'd like an opportunity to talk it over with you.

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RAILWAY AGE

Business Improving In Spite of "New Deal"

The *Railway Age* believes that it was the first publication of any kind in the United States to declare opposition to the New Deal. This opposition was declared, and the reasons for it given, in editorials published both before and after the passage of the original "recovery" legislation in June, 1933. It was not based upon the attitude of the Roosevelt administration toward the railroads, because from the time of Mr. Roosevelt's transportation address at Salt Lake City in 1932 to the present his special attitude toward the railroads has been more friendly than that of any other President for a quarter century. It was not based upon political grounds, because the *Railway Age* is strictly a business paper, and as such knew of nothing in the record prior to 1933 to encourage belief that, for business reasons, control of the government by either of the great political parties was preferable to control by the other.

The opposition of this paper to the New Deal from its inception was entirely economic—was based upon the ground that the economic premises, principles and policies of the New Deal were unsound, and that the adoption and administration of legislation embodying them inevitably would hinder the recovery from the depression which plainly had begun in the last one-third of 1932 and had been promptly resumed following the banking crisis in 1933. The trends of business in this country and throughout the world since June, 1933, indicate that this view was correct—that throughout the two years from July, 1933, to July, 1935, the policies of the New Deal not merely *hindered,* but *prevented,* any substantial, lasting improvement of business in general in the United States.

An Impressive Increase of Car Loadings

Within recent weeks some important developments have occurred. The Supreme Court rendered its decision destroying NRA, which this paper immediately predicted would prove the best thing for business that had occurred since the reopening of the banks in March, 1933. Subsequently, stock market prices, production of electric power and of steel, and contracts for private construction have rapidly increased. As a result, after having declined until in the two weeks ended July 13 they were relatively the smallest in two years, freight car loadings began to increase and in the eight weeks ending August 31 advanced 15 per cent. This compares with an advance in the same period in 1930 of 7.3 per cent; a decline in 1931 of 2½ per cent; an advance in 1932 of 12 per cent; and declines in 1933 of 3 per cent and in 1934 of 5 per cent. Analysis of the figures shows that never since the depression began has there been an increase of car loadings so impressively indicating the beginning or renewal of improvement in business, especially of increased production in the durable goods industries. The improvement looks like the real thing. If it continues unabated car loadings in the last one-third of 1935 will be the largest since 1930. Finally, on September 6 came President Roosevelt's letter to Roy W. Howard of the Scripps-Howard newspapers proclaiming that his program of "reform" was virtually consummated by recent legislation, and that "the breathing spell (for business) of which you speak is here—decidedly so."

The *Railway Age* is disinclined to question the sincerity or good intentions of a President who has promoted more legislation specifically to help the railways than any other since their early construction. What this paper does most strongly question is the economic premises and principles of Mr. Roosevelt's "reform" and spending policies, which we believe have done the nation in general, and the railways and the railway manufacturing industry in particular, incalculable harm during the last two years, and will, if persisted in, continue to do them incalculable harm.

What "New Deal" Has Done to Railways

Business is now improving in spite of these policies, and especially because of the destruction of NRA, one of the most harmful of them. It may continue to improve, but if so it will be because of the destruction of NRA and in spite of other New Deal policies, including the mass of hindering legislation recently passed by Congress—Guffey "little NRA" coal act, railroad retirement acts, Wagner industrial disputes act, social security act, "soak-the-rich" tax act, "work-relief" act for unproductive and insane spending—and the President's threat near the adjournment of Congress to

propose some kind of new general NRA at the next session.

There is no better evidence of the actual effects of past New Deal policies than the comparative records of railway traffic, gross earnings, operating expenses and net operating income in the four months April-July, inclusive, 1933, when the New Deal was just being incubated; in April-July, 1934, when it had been in effect a year, and in April-July, 1935, when it had been in effect two years. The records are given in the statistics in an accompanying table. They show in 1935 as compared with 1933 only a 3 per cent increase of car loadings; a 5.6 per cent increase of gross earnings; a 15.7 per cent increase of operating expenses; and a 26 per cent decline of net operating income. The railroads, and the industries dependent on buying by them for business, cannot regard with enthusiasm policies the effects of which have been so disastrous to them, in spite of the administration's manifest special desire to establish equality of government treatment of competing transportation agencies.

Railway Results, April-July, Inclusive, 1933, 1934 and 1935

	1935	1934	1933	Per cent change, 1935 compared with 1934	Per cent change, 1935 compared with 1933
Freight car loadings	9,894,113	10,200,980	9,593,395	−3.0	+3.0
Total operating revenue	$1,110,886,314	$1,106,234,648	$1,052,235,116	+0.4	+5.6
Operating expenses	851,035,005	827,037,562	735,238,516	+2.9	+15.7
Tax accruals	82,044,233	85,295,235	89,643,645	−3.8	−8.5
Equipment and joint facility net rentals*	40,916,583	44,289,697	42,395,733	−7.6	−3.5
Net operating income	136,890,493	149,612,154	184,957,222	−8.5	−26.0

* Includes uncollectible railway revenues.

Fundamentally Unsound Economic Policies

Why, and wherein, is the New Deal responsible for the present condition of the railways, and the consequent condition of the railway manufacturing industry? Primarily, it is responsible for them because its principal policies have been based upon socialist-union labor premises that economically are absolutely unsound, and which all previous experience, as well as experience throughout the last two years in this country, has demonstrated are unsound. The principal of these premises is, that depressions occur because there is not enough work to go around, that wages are not high enough, and that consequently the working class lacks purchasing power to buy the products of industry.

The obvious conclusion from this premise is that the way to end a depression is to increase the employment and purchasing power of labor by (1) reducing hours of work, (2) advancing hourly wages, (3) making huge government expenditures upon public works and relief. These were the principal New Deal policies adopted in 1933, and in accordance with which the operating expenses of the railways have been increased by advances in the costs of production and prices of the industries from which they buy, and by advances in their own wages, with a consequent reduction of 26 per cent in their net operating income and a corresponding reduction in their ability to contribute toward production and employment by buying from other industries. These New Deal policies plainly have not promoted recovery. Although they had increased the national debt by many billions of dollars, recovery actually was less advanced two years later than when they were adopted. Why? The major premise upon which they were based had no foundation in experience or fact. Consequently, conclusions drawn from it were wholly fallacious, and all policies based on those conclusions have tended to defeat their ostensible or actual purposes.

Business Improving in Spite of New Deal

Depressions are not caused, unless very indirectly and partially, by curtailed purchasing power of the working class, which buys principally *consumers' goods.* They are caused mainly, or almost entirely, by *reduced business purchases of durable goods.* The way out of them is to attack their principal cause—to do all that can be done to make it again actually and prospectively profitable for business to invest normally in durable goods. The very negation of this is, in the midst of depression, to impair the confidence of investors by increasing costs of production, prices and taxes; by using the taxpayers' money to engage in competition with existing invested private capital; by creating a hugely unbalanced government budget, and by monetary devaluation and wholesale repudiation of public and private debts. These, however, have all been policies of the New Deal. Production, commerce and employment in the United States stagnated under them for two years. It is striking evidence of the underlying strength of the country's economic system that they merely stagnated. It is a marvel that, instead of being wrecked by such policies, the economic system is now, largely owing to the destruction of NRA, showing striking powers of recuperation.

Those who share the economic views of the *Railway Age*—and there are millions more of them than two years ago—are not impressed by President Roosevelt's recent declaration that his program has "helped to restore that public confidence which offers so substantial a foundation for recovery," and that business is now free to go ahead. Business is again making progress in spite of the handicaps and hobbles with which it has been loaded and hog-tied by the New Deal policies of the last two years not yet held unconstitutional by the Supreme Court, and before it has begun to feel the effects of all the additional handicaps and hobbles of

the mass of legislation based on the same false economic premises and principles passed during the recent session of Congress. The present trend of business is strongly upward, as in the last one-third of 1932 and the second quarter of 1933 before the New Deal arrested its improvement. Let us hope that the latest efforts of the New Deal to create prosperity by attacking the means of creating it will be less effective than its similar efforts during the last two years.

Have President's Economics Changed?

The most fundamental and important question raised by the President's letter to Mr. Howard is this: *Have his economic premises and principles changed since Congress adjourned?* There is nothing in his letter to so indicate. Business in general can hope for no help from him until they have changed—or until he begins to act contrary to them. This is fundamental, because there is an absolute conflict between the socialist-union labor economics thus far actuating the New Deal and the economics of capitalism in accordance with which government and business must act in order to restore production, employment and prosperity in private business. The direct tendency of all socialist-union labor policies is to destroy capitalism, which is simply private ownership and management of property for profit. Just in proportion as socialist-union labor policies are kept in effect or adopted they will curtail or destroy profits, and thereby curtail or destroy the advantages of private property. The present danger of government ownership of railways is entirely due to the effective application of such policies.

Again, then, we ask: Have the President's economic premises and principles changed since Congress adjourned? If not, business in general must face the cold, disagreeable, important fact that whatever progress it makes during the next sixteen months at least will have to be made in spite of the determined resistance of the administration at Washington. The government's actual policies will have much more important effects than the President's enticing interpretation of them for the seduction of business.

Equipment Loans at Less Than 3 Per Cent

The Chesapeake & Ohio last week, offering an issue of $9,000,000 of its 3 per cent equipment trust certificates, received a high bid of 101.0713, which will make the annual interest cost to the railway only about 2.85 per cent. The investment houses which have bought the issue are offering it to the public at prices which average about 2.65 per cent. Not for many years, if ever, has equipment financing been arranged on such favorable terms.

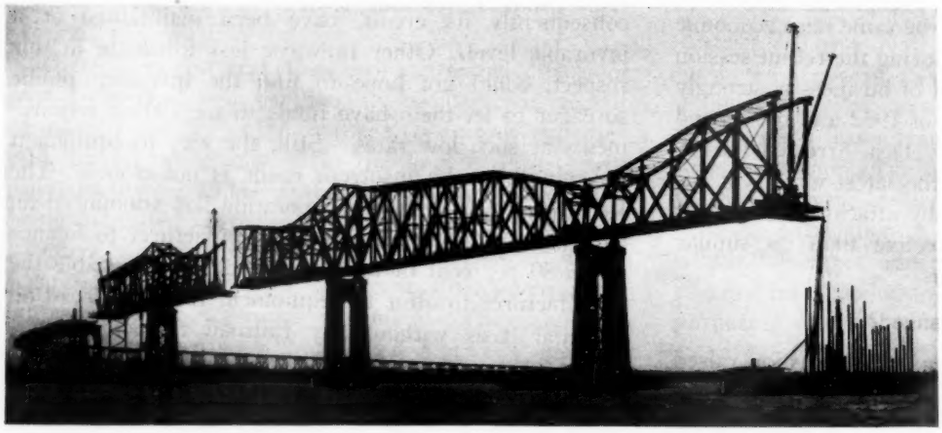
The Chesapeake & Ohio, of course, is somewhat of an exception among railways in that its earnings, and consequently its credit, have been maintained at a favorable level. Other railways, less fortunate in this respect, could not hope to find the investing public so eager to let them have funds to meet their requirements at such low rates. Still, the way to equipment financing even by insolvent roads is not closed. The Reconstruction Finance Corporation has announced an agreement with one equipment manufacturer to finance up to 80 per cent of the cost, which would enable the manufacturer to offer the equipment to the railroad on a rental basis without any railroad financing whatsoever.

Furthermore, the Railroad Reorganization Act recently passed by Congress clarifies the status of equipment trust certificates, definitely establishing the property rights of the trustees in the equipment until payments have been completed, and not subjecting these securities to the hazards faced by other security holders in the event of reorganization. This clarification should re-establish these securities firmly in the high regard of investors, and, in fact, has done so already.

Almost all the railroads can make profitable use of new equipment—not yet, unfortunately, because it is needed to handle growing traffic; but to replace existing old equipment which each day becomes more costly to operate. This condition has existed ever since the onset of the depression, and its prolongation has constantly augmented the percentage of profit which money spent in replacements might earn. But money for replacements, however profitable its investment might be, has been hard to get. Now, however, that obstacle has all but disappeared. Moreover, the return to be earned by the borrower of 3 per cent money is considerably better than that which can be made at 4 or 5 per cent or higher.

There is, of course, a natural hesitation to invest new capital while that already invested is earning so little. An increase in railway traffic is the one way to augment the earnings of capital already invested. The dependence of traffic-originating industries on railway orders for normal business being what it is, is there any surer way of securing a substantial traffic increase on the railways than purchases by the railways of whatever they can buy at unquestionable profit to themselves with the credit available to them at reasonable rates? The vicious circle of traffic poverty and reduced railway buying has got to be broken through somehow, sometime. Does not the cheap money available, and the improved status of equipment trust certificates, indicate a point of least resistance where a breach might be made in the defenses of the depression?

The freight car surpluses reported within recent months have been the smallest since 1929, owing to the fact that the number of cars owned by the railways has declined by about 430,000 since 1930. The increase in car loadings since the middle of July has been relatively the largest in the same period of the year since the depression began. If this increase in traffic continues, it may not be long until new cars will be needed, and not merely for replacements.

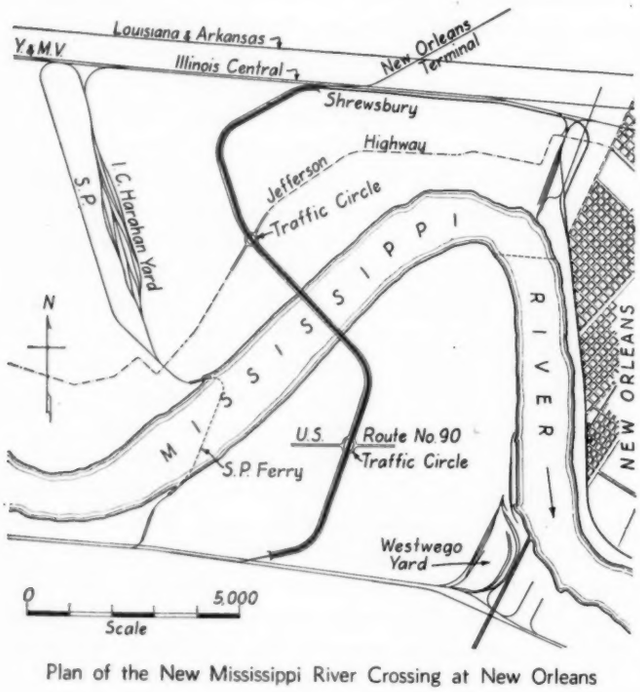


A Progress View in the Erection of the River Structure, Showing Two Derricks at Work on the West Half of the Cantilever Structure (at the Left) and Cantilever Erection of the 531-Ft. Simple Span at the Right. The Floating Pile Driver Shown in the Lower Right-Hand Corner is Driving Steel Piles for a Falsework Bent

Great Bridge at New Orleans Nearing Completion

Deep water and strong current impose difficult problems that lead to special methods in both substructure work and superstructure erection

WORK is now nearing completion on a bridge across the Mississippi river at New Orleans, La., that is the largest and by far the most costly structure to span that great stream. Designed to accommodate both railway and highway traffic, it will be the fifth bridge south of St. Louis, Mo., and the twenty-ninth structure south of the Twin Cities to carry railway trains across that river. While the Mississippi was bridged at Memphis, Tenn., as long ago as 1892, the greater depth of water and the still greater depth to stable foundation material proved effective obstacles to bridge construction south of the Tennessee metropolis for many years, so that it was not until 1928 that a bridge was built at Vicksburg, Miss. Although the need for a bridge at New Orleans has been far more urgent, the formidable financial problem proved insurmountable until a loan was obtained from the Reconstruction Finance Corporation in 1932.



Plan of the New Mississippi River Crossing at New Orleans

Projected originally by the New Orleans Public Belt, a municipally-owned terminal line, the project was advanced through the agency of two amendments to the state constitution of Louisiana, one ratified in 1928 empowering the city of New Orleans to issue $20,000,000 in bonds secured by a lien against the terminal property, and a second approved in 1930 authorizing the state legislature to appropriate $7,000,000 toward the cost of the bridge on the condition that provision be made for highway traffic which is to be handled free of all tolls. The bridge will be used by the trains of the Southern Pacific, under the term of a contract entered into by the Morgan's Louisiana & Texas and the Texas & New Orleans, guaranteed by the Southern Pacific and approved by the Interstate Commerce Commission.

The bridge is located about 3.3 miles west of the business center of the city, or about 9 miles upstream (following the meanderings of the river) from the foot of Canal street. It is about one mile downstream from the west side slip of the Southern Pacific car ferry crossing.

Long Approaches

Because of the low level of the land bordering the river and the requirement of the United States engineers that the river spans provide a clear headroom of 135 ft. above high water level, it was necessary to construct approaches of unusual length. Thus, with track grades of 1.25 per cent, compensated for curvature, the east approach viaduct has a length of 8,680 ft. and the west

approach 10,791 ft. The west approach connects with the Southern Pacific tracks about 2,500 ft. downstream from the approach to the west slip of the ferry transfer that has been used up to this time for moving the trains of that railway across the river.

The east railway approach connects with the tracks of the Illinois Central and the Yazoo & Mississippi Valley at Shewsbury, where a connection is made also with the New Orleans Terminal, a belt line owned by the Southern. In addition, a new line about 8,000 ft. long has been extended east from the Illinois Central connection to a connection with the belt line of the New Orleans Public Belt, which occupies a right-of-way along practically the entire water front of the city on the east bank of the river, with connections to all the railways serving New Orleans.

The highway decks on the bridge approaches descend on grades of four per cent to traffic circles at the junction with the Jefferson highway on the east bank and U. S. highway No. 90 on the west bank, these approach ramps being 2,060 ft. and 3,578 ft. long, respectively.

A View of the Through-Truss Structure—Lower Left Corner Shows Angle Ties Connecting the Highway Floor Bracket to the Railroad Deck Floor Beam

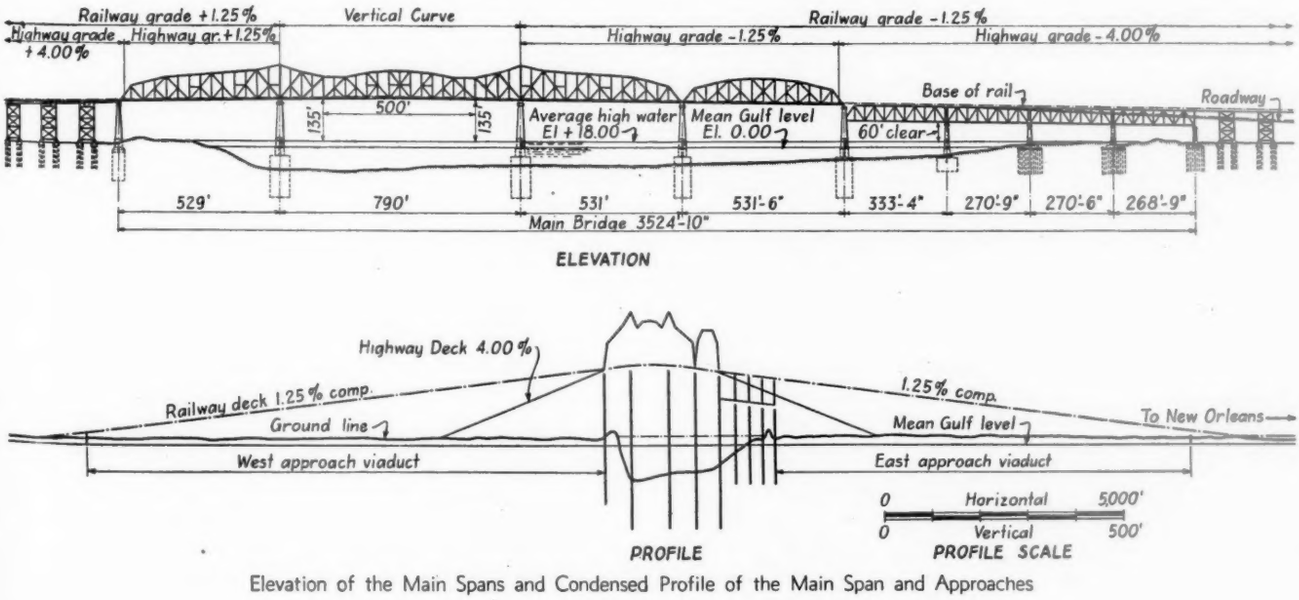
The River Bridge

The main bridge or river crossing is 3,524 ft. 10 in. long, and consists, from the east bank to the west bank, of three 267-ft deck truss spans, one 330-ft. deck truss span, one 528-ft. 2½-in. simple through truss span and a three-span through truss cantilever structure made up of a 790-ft. central span and two 528-ft. 2½-in. flanking spans.

The trusses of the through spans are 33 ft. center to center and accommodate two railway tracks inside the trusses, with an 18-ft. roadway, flanked on the outer side by a 2-ft. 6-in. sidewalk, outside each truss, supported on cantilever extensions of the floor beams. Throughout the length of the deck truss spans, which have trusses 29 ft. center to center, the highway decks are supported on transverse cantilever brackets framed into the posts of the main trusses, these transverse trusses being placed at such elevations at the different panel points that the highway deck is supported on a four per cent descending grade from the west end of the east deck truss.

Silicon steel has been used in the railway floor system, parts of the lateral system, and in all of the truss members except certain struts and hangers which were made of medium carbon steel, and except for eye-bars which were made of heat-treated carbon steel. Eye-bars were used for the entire bottom chords of the deck spans, and for certain web members and a part of the top chord of the cantilever structure. The superstructure was designed for a live load of two Cooper's E-90 locomotives proceeded and followed by a uniform load of 7,500 lb. per lineal foot of track, plus an impact allowance, and a live load of 1,080 lb. per lin. ft. of the highway deck, with a basic unit stress of 30,000 lb. per square inch for the silicon steel members and the heat-treated eye-bars. The highway floor and brackets were designed for a live load of 35-ton truck proceeded and followed by 1,000 lb. per lin. ft. per lane of traffic.

The structural framing follows current practice, the largest compression members being of a C. B. section with two three-ply webs, 42 in. deep, connected by a diaphragm on the transverse axis, 30 in. wide, and top and bottom double lacing. The gross section is 334 sq. in. The floor beams for the railway floor are framed between the trusses, and the highway brackets are framed against the outside of the trusses, the tension in the top flanges of the brackets being carried into the top flanges



Elevation of the Main Spans and Condensed Profile of the Main Span and Approaches

of the floor beams through angle ties that straddle the vertical web members and are attached to the top flanges by means of horizontal gusset plates.

The track is constructed of 110-lb. RE rail with M. & L. fastenings on 8-in. by 10-in. ties spaced 16 in. center to center on the main bridge and 10-in. by 12-in. ties on the approaches, every fourth tie being extended to support walks on the outer sides and between the tracks. These walks are floored with checkered walkway plates and the track ties are covered with 18-gage copper-bearing galvanized steel sheets. In the truss spans, there are two stringers per track spaced 6 ft. 6 in. center to center.

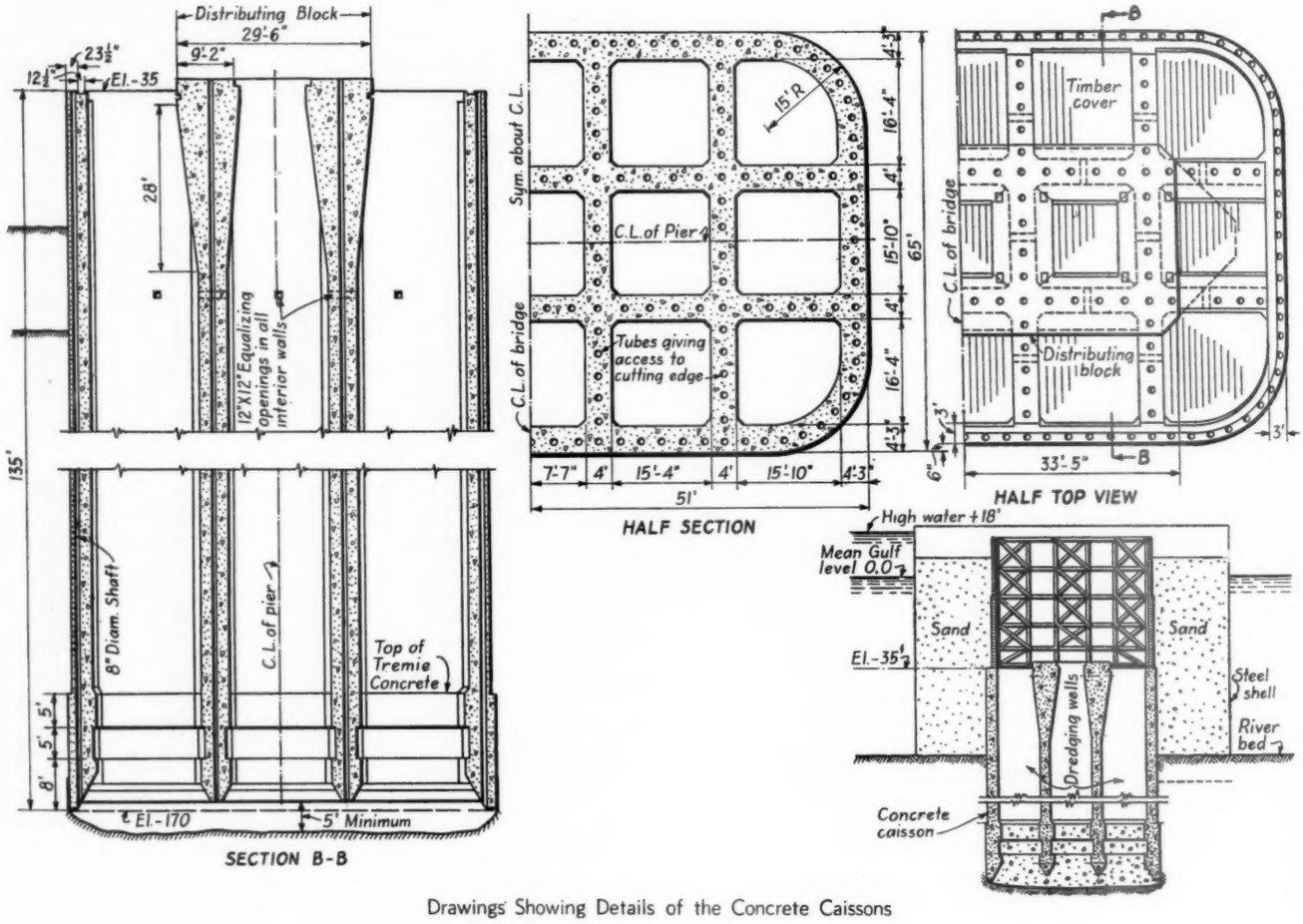
The highway deck is a 7-in. concrete slab reinforced with fabricated trusses. This slab is supported on 12-in. transverse beams that are carried by the highway deck stringers of the truss spans and the highway girders of the approach viaducts, these stringers and girders being in pairs, 11 ft. center to center.

In general detail and outline, the approach viaducts conform to conventional practice. The east approach embraces 141 bents (70 towers and 1 single bent), the distance from base of rail to top of masonry ranging from 18.16 ft. to 112.01 ft., while the west approach embraces 174 bents (87 towers) with corresponding heights ranging from 17.9 ft. to 137.7 ft. To overcome, as far as possible, the lack of balance in girder designs that is imposed in such structures by the adoption of the same depth for both the tower spans (45 ft. long) and the clear spans (69.8 to 84.16 ft. long), the webs and flanges of the clear-span girders, both railway and highway were constructed of silicon steel, all other material in these girders being of medium carbon steel. Silicon steel was used also in the webs and flanges of the box-type cross girders at the tops of the bents, as well as in the main material for the columns of the 108 taller bents of the west viaduct and the 84 taller bents of the east viaduct. These columns are of an H-section formed of an 18-in. 58-lb. Bethlehem section, together with either two or four plates 22 in. wide and from ½ to ⅝ in. thick, and four 4-in. by 4-in. angles. The highway decks are supported on cantilever brackets, the members of which are framed into the columns by means of gusset plates, through which the lateral components of the stresses are carried into members forming a part of the bent sway bracing.

The steel for the river spans totaled about 20,000 tons and that for the approaches about 40,000 tons.

The material underlying the bed of the Mississippi river at New Orleans consists of silt, sand and clay to unknown depths. Therefore, the foundation problem was that of determining to what depth the pier footings must be carried to insure safety under conditions of maximum depth of scour and to obtain the requisite bearing power. Studies led to the decision to carry the piers in the deeper part of the river, namely, Piers 1, 2, 3 and 4, to a depth of 170 ft. below mean gulf level; Pier A on the west bank to Elevation-115; and Pier 5 to Elevation-80. All six of these piers are supported on concrete caissons, while Piers B, C and D are on pile foundations, the piles being untreated timber.

The caissons for Piers A to 5, inclusive, were sunk by the open dredging method and all of the caissons except the one for Pier A, which is located on dry land, were constructed and sunk by the "sand-island" method, certain features of which are controlled by patents held



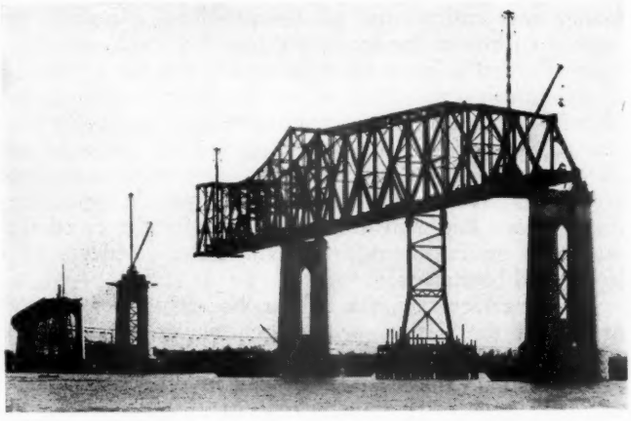
Drawings Showing Details of the Concrete Caissons

by M. F. Clements, bridge engineer of the Northern Pacific, and Nick F. Helmers of the firm of Siems-Helmers, Inc., St. Paul, Minn., who was the contractor for the main river piers. This method was first used on the Southern Pacific's Siusun Bay bridge and was described in an article on that project in the *Railway Age* of June 21, 1930, page 1458.

The Sand Islands

Briefly, this method involved the construction of cylindrical steel shells, 121 ft. in diameter for Piers 1 and 2, and 111 ft. for Piers 3 and 4, that rested on the river bottom and extended 16 feet above the water surface, and then filling these shells with river sand to form artificial islands on which reinforced concrete caissons containing 15 dredging wells could be constructed in the dry and through which the caissons could be sunk by dredging. This procedure obviated the difficult and hazardous operation of launching the caissons from ways, floating them to the pier sites and holding them in position against the swift current until they were landed on the river bed.

The following description applies to the work on Piers 1, 2, 3 and 4, but only in part to that at Pier A, where

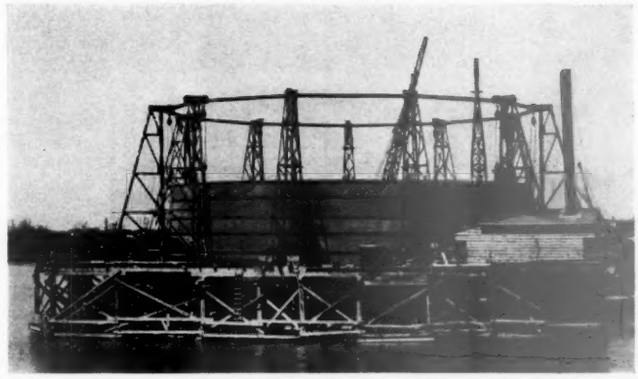


A Progress View of the River Span Erection—Completed Each Anchor Arm of the Cantilever Structure at the Right with Derrick in Position on the Top of Pier 1 Ready to Start the Balance-Cantilever Erection of the West Arm of the Cantilever Structure—West Approach Viaduct in the Background

no sand island was required, and to that at Pier 5, where the island was supported by a ring of Carnegie steel sheet piling instead of the fabricated steel rings described below.

Prior to placing the rings, the site of each pier was protected from scour by a woven willow mattress 250 ft. wide by 450 ft. long (up and downstream) that was weighted with rock to sink it to the river bottom and held in position by three upstream permanent anchors. Following this, a ring of falsework was constructed around the space to be occupied by the island, using Douglas fir piles, with 24-in. to 30-in. butts and 14-in. to 16-in. tips in lengths up to 130 ft., that were driven by a floating pile driver. This served as the support for the steel shell as it was assembled in successive plate-and-angle rings, as well as a group of steel A-frames equipped with hand-operated hoists by means of which the shell was lowered as additional rings were completed on top of those previously assembled. All the rings were 10 ft. high except the ones at the bottom which were 5 ft. high and the next two above which were 2½ ft. high, the two short rings being introduced to permit the salvage and reuse of the largest possible amount of shell after work on a caisson had been completed.

After each shell was completed, the A-frames were



Erection and Sinking One of the Steel Shells that Enclosed a Sand Island

removed so that the falsework could be used to support two large revolving derricks and a boiler plant that were required for filling the shell and in the various operations incident to the construction and sinking of the caisson. The willow mattress was cut off inside the shell and removed before the filling was placed.

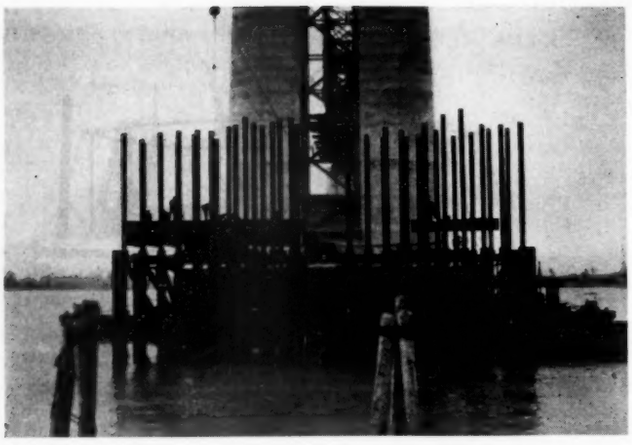
The Caissons

The caissons, of which the two larger ones for Piers 1 and 2 were 102 ft. by 65 ft. in plan, are cellular structures with walls about 4 ft. thick, constructed over a steel cutting edge, and embracing 15 dredging wells. Eight-inch vertical tubes were provided in the walls for use in jetting and in removing obstructions, although it was found unnecessary to use them for the latter operation. In addition, 14 releasing jets were provided in the outer walls to reduce the skin friction, but little use was made of them.

The caissons were concreted in sectional steel forms in lifts of 10 ft. and were likewise sunk 10 ft. at a time by dredging. This operation of alternate concreting and sinking was continued until the caisson had been completed to a full height of 135 ft. and sunk until the top was about 17 ft. above mean gulf level. The height of 135 ft. was established by the requirement of the United States War Department that the top of the caissons, when in final position, must be not higher than Elevation-33. For this reason, it was necessary to build timber cofferdams on top of the caisson to a height of 50 ft. to permit the sinking of the caissons to the required bottom elevation of -170.

After the final elevation was reached, the walls of the caissons were washed down, the bottoms of the wells cleaned and a tremie concrete seal not less than 20 ft. deep was placed in each well. However, this was done progressively, well by well, starting with the central well

A Construction View of One of the 15-Cell Caissons



Structural Steel Cage and Steel Piling for One of the Steel Erection Bents

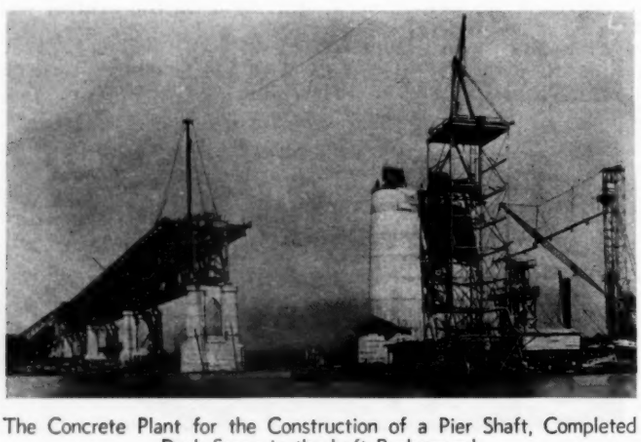
and finishing with the three outer wells at each end. The object of this procedure was to avoid excavation below the cutting edge in all the cells at one time, since this would have resulted in further sinking.

The placing of the seals was probably the largest tremie concrete operation ever undertaken and involved the use of tremie pipes 198 ft. long. Three of these pipes, each 10 in. in diameter with a 2-yd. hopper at the top, were used simultaneously in sealing each cell. Six and one-half bags of cement was used per cubic yard of concrete and tests of different consistencies showed that a slump of 4 in. to 6 in. produced the best results.

As the wells were not filled with concrete above the seals, they were not unwatered but the water was drawn down in the cofferdam to the top of the caisson, Elevation -35, to permit the construction of timber covers for the wells, which were carefully sealed to keep out silt. The covers over the three inside wells and a narrow strip along the inside edges of the other covers served also as the floor form for the concrete distributing block, or base of the pier shaft, 30 ft. high. Above this distributing block, namely, from 5 ft. below to 25 ft. above mean gulf level, each pier is faced with granite ashlar masonry. The outline of the pier shafts, proper, as seen in the illustrations, comprises twin concrete columns connected by a diaphragm that is pierced for most of the height by a window terminating at the top in a gothic arch.

Concrete Work

All of the concrete work was handled from a mixing plant, mounted on a barge, that had a capacity of 120 cu. yd. of concrete per hour. The materials were proportioned by weight and the cement, which was delivered in bulk, was blown into the cement hopper through a Fuller-Kenyon pump. Concrete for the caissons was delivered through a tower-supported chute, while the concrete for the pier shafts was hoisted in bottom-dump buckets by means of a stiff-leg derrick with a 70-ft. boom mounted on a tower 110 ft. high that was supported on two barges lashed together. Each of the two larger piers required 24,000 cu. yd. of concrete (including the caisson and seal) and 450 cu. yd. of granite masonry.



The Concrete Plant for the Construction of a Pier Shaft, Completed Deck Spans in the Left Background

The cofferdam was removed as soon as the work of the concreting of the pier was above high water level. The sand island was removed by dredging out the sand and sending down a diver to disconnect the sections of the steel ring as far down as he could reach them, after which the shell was raised and dismantled in an operation that was just the reverse of that employed in placing them. The A-frames were re-erected on the falsework to carry out this operation.

The viaduct substructure is supported on untreated timber piles, the allowable bearing load on these piles being verified by a loading test that embraced a complete group of piles for one of the pedestals.

Special Erection Problems

The use of falsework, in the ordinary meaning of that term, for the erection of the through spans of the river bridge was entirely out of the question. However, the fact that three of the spans comprised a cantilever structure afforded a favorable opportunity for the application of the cantilever method, which could be readily applied also in the case of the simple span by introducing temporary ties between the west hip joints of that span and those of the adjoining east anchor arm of the cantilever structure. Nevertheless, a serious obstacle was introduced, since this plan did not provide for the erection of one span on falsework from which the cantilever erection could be started.

As a consequence, the two anchor arms were erected first, using the De Vou balanced-cantilever method, a patented process in which the use of falsework is confined to two bents. In general, the plan involves the simultaneous erection of the superstructure of two spans by the cantilever method from one pier so that the weight of metal placed in the two spans is substantially balanced. A bent is erected at the second panel point from the pier in one of the spans and the erection in that span is kept sufficiently in advance of that in the opposite span, so that an adequate reaction is maintained on the bent as well as the pier to insure a condition of stable equilibrium. Subsequently, a second bent is provided at about mid-span and the first bent is removed, after which the erection is continued to the far pier.

In the sequence of operations on the New Orleans bridge, this process was employed, as described, on the two anchor arms of the cantilever structure, the two cantilever arms being erected as far out as was required to maintain the requisite balance. The erection of the 528-ft. simple span was prosecuted by the cantilever method from the east end of the east anchor span, to a single bent at mid-span and then continued to Pier 4 by the same method.

Bents on Steel Piles

The key to the practicability of applying this plan at New Orleans was the development of supports for the bents that would insure freedom from settlement and absolute stability. It also involved the accurate driving of long piles in the strong current. The solution of the problem was an ingenious one. Twelve-inch C.B. section steel piles weighing 85 to 110 lb. to the foot and spliced in various lengths as necessary served as the support for the bents, and to facilitate accuracy in driving

and to hold them in line against the current, as well as to provide a means of bracing them, a structural steel cage supported between two barges was floated into position and securely anchored while the piles were driven in suitable guides provided in the cage. After the piles were in place, they were bolted to the members of the cage, which then served as the support for a superimposed grillage on which the steel bent was erected. The bents used under the anchor-arm spans were supported on 40 steel piles arranged in two rows 20 ft. center to center. A double bent was used under the simple span resting on 80 piles.

Use Guy Derricks

Another noteworthy feature of the erection was the use of steel guy derricks, with 113-ft. 6-in. masts and 95-ft. booms, in place of derrick cars or locomotive cranes, this expedient being dictated by the necessity for starting work from the tops of isolated piers. No hoisting equipment was placed on the spans. All lines from the derricks were carried from the deck to blocks at the piers and thence down to hoisting engines mounted on barges that were moored to the piers. All signals were transmitted by telephone. The masts were stayed in the longitudinal direction by guy lines extending from the tops of the masts to the tops of the adjacent piers and in the transverse direction by lines to the ends of steel needle-beams 85 ft. long that were secured in a transverse position to the underside of the bottom chords of the trusses directly under the derrick in each position.

In starting work at the top of a pier, these needle-beams were erected first (by means of a barge derrick) in pairs 12½ ft. to either side of the up-and-down-stream center line of the pier, on "pier beams" that were held in place by long anchor bolts into the pier. Next, one panel of the floor system, including the center-pier floor beam, was set in position. Following this, the first derrick was hoisted up and supported by means of a skid on the floor stringers previously set, and after this derrick had erected the bottom chord and a triangle of the web system in the span from the pier to the steel bent (two panels in length), it hoisted up the second derrick, so that erection in the two spans could proceed simultaneously, the derricks being skidded forward as the work advanced.

The elevation of the spans during cantilever erection was controlled by means of jacks provided on the tops of the steel bents, but the adjustment of the position of the ends of the chords of the suspended span of the cantilever structure during the operation of closing was effected by means of jacks introduced into the top and bottom chords of the cantilever arms. The four deck truss spans were erected by means of the guy derricks on falsework consisting of individual bents under alternate panel points.

The approach viaducts were erected by means of a stiff-leg derrick supported on a triangular frame composed of three girders that were mounted in turn on four trucks with double-flanged wheels. This traveler was assembled on top of the highest tower of each viaduct, which had been previously erected with ground equipment, following which the viaducts were erected progressively in the down-grade direction, with the truck wheels on rails supported on the center line of each track.

A 90-ft. boom provided the necessary reach for the erection of all bents, but some of the taller bents had to be strutted temporarily to the towers previously erected until the traveler could erect the second bent and place the tower bracing. The girders were erected in pairs, fully braced and with ties in place, in all cases except over the first tower.

Modjeski, Masters & Case, Inc., New York, were the engineers for both the design and construction. Moran & Proctor were consulting engineers on the foundations.

The contractors were as follows: Main river bridge substructure, Seims-Helmers, Inc., St. Paul, Minn.; approach substructures, MacDonald Engineering Company, Chicago; river bridge superstructure, American Bridge Company, New York; and approach superstructure, McClintic-Marshall Corporation, Bethlehem, Pa.

Work on the substructure of the river bridge was started on December 30, 1932, and was completed on November 28, 1934. The substructures for the approaches were under construction from December 30, 1932, until May 10, 1934, while the erection of the approach superstructures was started on June 28, 1933, and completed on November 20, 1934.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended August 31 totaled 679,861 cars, reaching a peak for this year so far. This was an increase of 53,488 cars as compared with the preceding week, 32,330 cars as compared with the corresponding week of last year, and 6,083 cars as compared with 1933. Much of the increase was in the loading of coal, 131,526 cars, which was an increase of 31,593 cars as compared with the week before and of 10,312 cars as compared with last year, but miscellaneous freight also showed an increase of 20,041 cars as compared with 1934 and all commodity classifications except live stock showed increases over last year and the week before. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

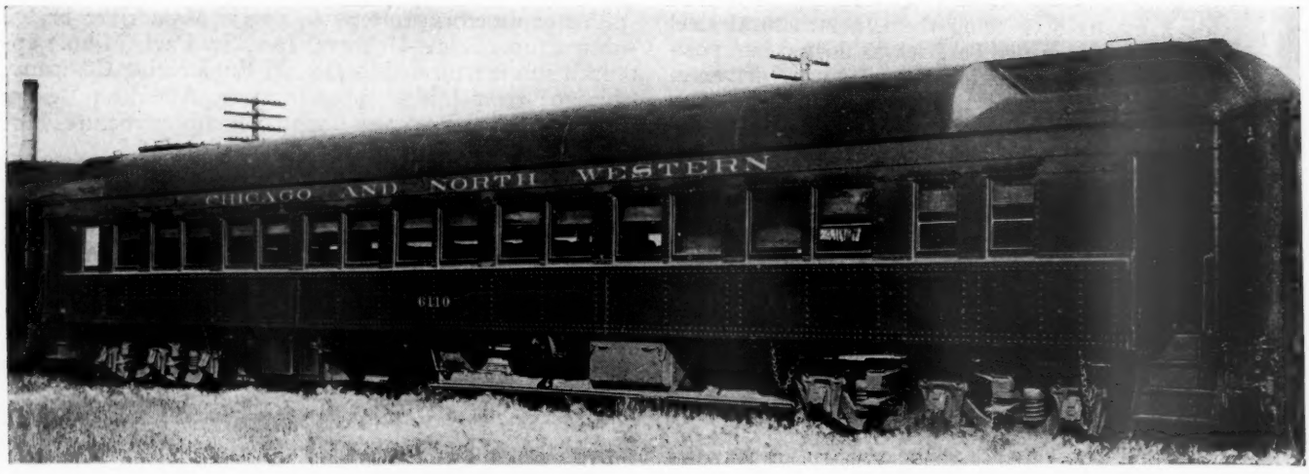
For Week Ended Saturday, August 31, 1935

Districts	1935	1934	1933
Eastern	142,354	136,416	150,034
Allegheny	130,141	114,756	139,128
Pocahontas	48,465	44,137	49,700
Southern	93,457	88,998	88,662
Northwestern	110,318	100,793	101,916
Central Western	101,891	104,628	94,378
Southwestern	53,235	57,803	49,960
Total Western Districts	265,444	263,224	246,254
Total All Roads	679,861	647,531	673,778
Commodities			
Grain and Grain Products	44,544	38,510	32,515
Live Stock	14,170	36,891	18,610
Coal	131,526	121,214	142,200
Coke	6,033	5,280	7,432
Forest Products	31,368	21,818	25,904
Ore	35,626	26,939	41,877
Merchandise L.C.L.	162,540	162,866	172,223
Miscellaneous	254,054	234,013	233,017
August 31	679,861	647,531	673,778
August 24	626,373	606,917	637,510
August 17	615,006	601,788	643,406
August 10	583,743	603,968	629,743
August 3	597,083	612,660	620,482
Cumulative Total, 35 Weeks	20,506,860	20,860,502	19,047,609

Car Loading In Canada

Car loadings in Canada for the week ended August 31 totaled 47,380, as against 52,888 cars for the corresponding week last year and 43,847 cars for the previous week this year, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
August 31, 1935	47,380	18,229
August 24, 1935	43,847	18,034
August 17, 1935	43,101	17,728
September 1, 1934	52,888	19,983
Cumulative Totals for Canada:		
August 31, 1935	1,505,891	744,787
September 1, 1934	1,495,810	772,785
September 2, 1933	1,264,145	635,956



The Waukesha Unit Is Installed in Space Formerly Occupied by the Ice Bunker—The Unit Is Well Within A. A. R. Clearance Limits

Air-Conditioning With No Locomotive Power Drag

New system developed to protect faster schedules and to reduce operating costs

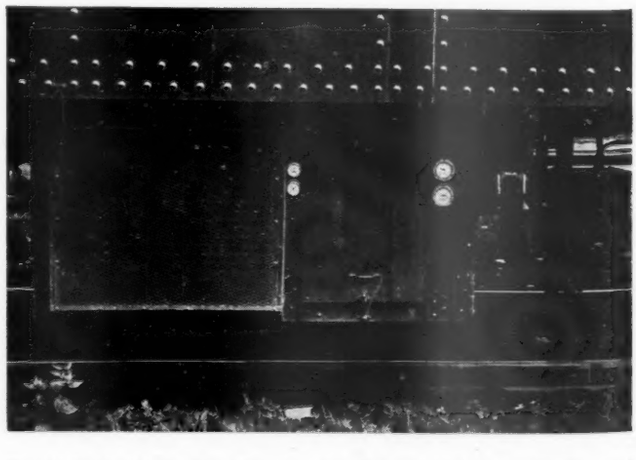
THE Chicago & North Western has been operating, since last June, coach No. 6110 air-conditioned with a new mechanical refrigerating unit which was substituted for the ice bunkers formerly used for cooling. Working in co-operation with North Western's car department, the Waukesha Motor Company, Waukesha, Wis., developed a complete engine-driven refrigerating unit using "bottled" propane gas for fuel.

An Independent Engine-Driven Unit

Like the ice-cooled system, this mechanical unit does not require steam or electricity generated by the locomotive for its operation, and, as its total weight ready for service is but 2,850 lb. complete, a net saving in the required tractive force to handle the train is effected. Within this weight and the space formerly occupied by the two ice bunkers on Coach 6110 is a complete independent engine-driven compressor and condenser unit with fuel supply sufficient to last from three to five days without refueling. The entire mechanism is built on a structural-steel chassis and mounted on pneumatic tires which are supported by channel-iron brackets secured to the underframe of the car so that vibration and noise cannot be transmitted to the occupants of the car. Flexible refrigerating and fuel lines permit withdrawal of the unit on extensions of the mounting rails for convenience in servicing and inspection. The entire unit can be quickly replaced without taking the car out of service. Tests so far show that fuel cost has averaged one dollar per 1,000 car-miles; less on fast runs than on the slower runs.

Fundamental Requirements

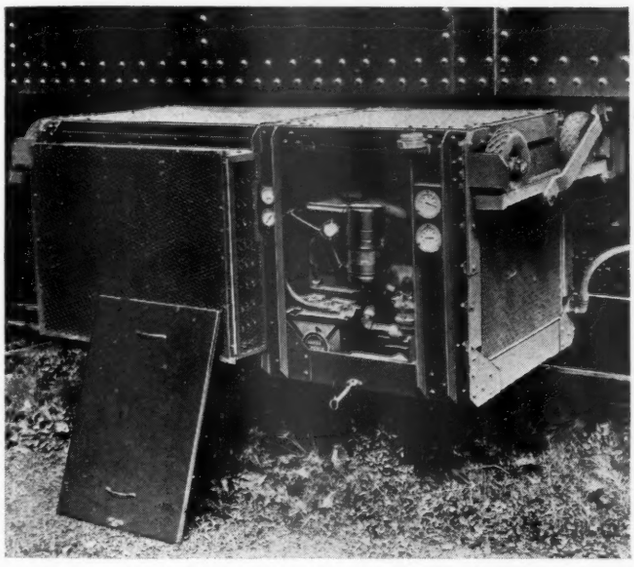
In developing an engine-driven refrigerating unit, a number of basic considerations were set up as conditions for a satisfactory design. In the order of their importance, it was felt that (1) it must not impose an additional load upon the locomotive, sometimes already overloaded, either for steam or electric power generation; (2) it must be economical to operate and maintain—cheaper in operation than existing systems; (3) it must be applicable to existing equipment with no major changes; (4) it must be simple, compact and safe; (5) it must have adequate capacity to meet the most severe weather conditions for long periods at a time; (6) it must not require time en route for recharging or routine servicing; (7) it must be instantly available for use regardless of car location—not dependent upon car movement and entirely independent of battery power; (8) it



The Unit Under the Car, Showing the Channel Tracks for Its Renewal Folded Back in Operating Position—The Circulating Water Pumps Are Enclosed at the Right—The Test Cages Are Not Standard Equipment

must be fully automatic in operation and responsive to thermostatic control; (9) it must be clean, quiet and smooth in operation.

The introduction of bottled propane gas, and its wide commercial distribution by the petroleum refineries has made it at once practical and economical to consider an engine-driven unit. Propane has the high heat value of 21,600 B.t.u. per lb. and one gallon weighs 4.2 lb. It is liquefied at moderate pressures and temperatures, but at atmospheric pressures gasifies readily. Shipped in tank cars as a liquid, the pressure at 70 deg. F. is 125 lb. per sq. in. In Texas and Oklahoma where is has already found a large market and is distributed by practically all the oil refineries, its quoted price is three cents per gallon in car lots, f.o.b. the refinery. Propane has nation-wide distribution. It thus affords a potential power which, based on its heat value, is even cheaper than Diesel fuels. Because of its prompt evaporation, it is safe to handle as no puddles of the liquid can form. It is an ideal fuel for internal-combustion engines because it has high anti-knock characteristics, with an octane rating of 125, forms a true and perfect gas mixture without adjustment, requires no choking for starting,

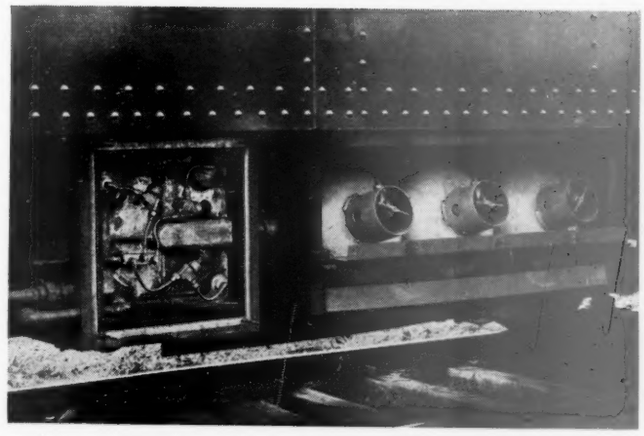


The Unit Rolled Out From Under the Car on the Folding Track for Maintenance

and produces no crankcase dilution. It burns without smoke and does not exhaust noxious or poisonous gases.

The Mechanical Unit

With the proper fuel available, the selection of the Waukesha heavy-duty industrial engine as a basis for the design was adopted. This engine has been modified to increase its compression ratio to 9:1 so that the operation of the engine on propane gas is extremely economical. This solved the power problem most satisfactorily as each car has its own individual self-generating power unit. The locomotive is thus relieved of all additional burden and, in fact, the dead load is reduced as the weight of the complete unit is under 3,000 lb. per car, and the equipment which it replaces is generally much heavier. The engine is connected by a three-shoe expanding clutch operated by inertia to a four-cylinder vee-type refrigerant compressor which is driven by multiple V-belts. Secured to the compressor housing on either side are large tubular condensers, air-cooled, while the forward end of the compartment is opened to admit air which is drawn in by a large propeller-type fan.



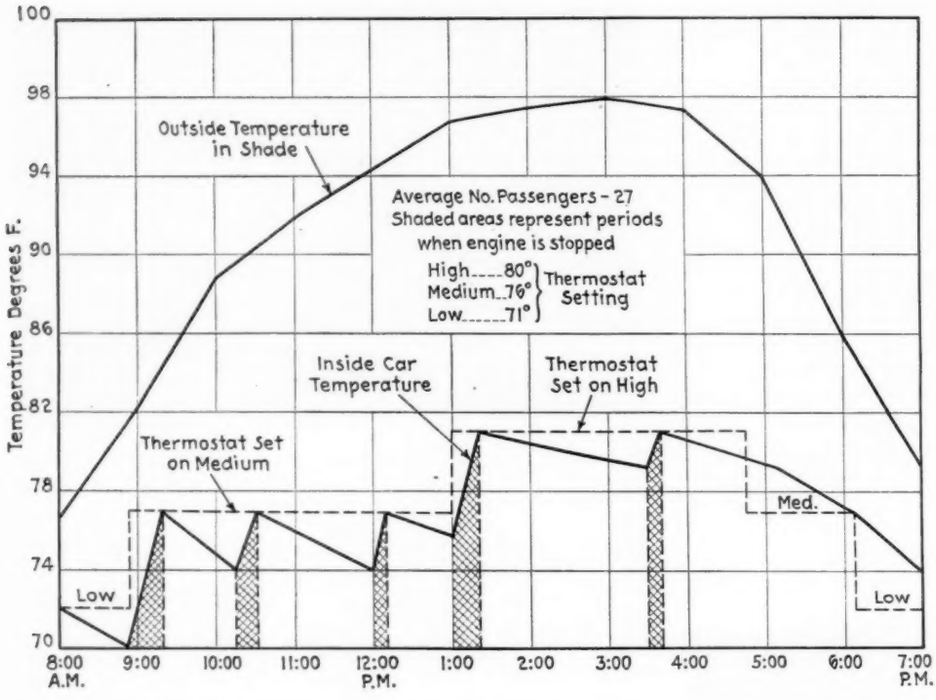
The Fuel Cylinders and Holder with the Covers Removed—The Heat Exchanger Shown at the Left Is Not Used with Direct-Expansion Cooling

Heavy grilles protect the fan openings as well as the condensers from mechanical damage.

The entire unit falls well within the limits of conventional ice bunkers. Its overall length is 72 in., its height 31½ in. and its width 39 in. The unit in the chassis weighs 1,650 lb. Balancing the unit on the opposite side of the car in the place occupied by the ice bunkers is the fuel-receiver holder and rack, the weight of which with three loaded receivers is 600 lb. The fuel section is considerably smaller with a length of 54 in., width of 44 in., and a maximum height of 32 in. The installation on existing ice-cooled cars requires only the removal of the ice bunkers and the installation of the hangers for the compressor unit and the fuel receiver on the opposite side.

Within the car, the circulating water system may remain unchanged if a heat exchanger is mounted beneath the car on the same side as the fuel-receiver rack and the water circulated in the conventional manner. The modern direct-expansion system can be applied if desired with almost equal facility, and provides more efficient operation by substituting the refrigerant itself for the water in the car-cooling coil and operating with direct expansion in the coil. The North Western trials were conducted with the installation made both ways to compare the relative efficiencies.

In selecting the proper size of units, it was felt that by relieving the locomotive of the power requirements, the only limitation to adequate capacity was the maximum requirements developed by experience. A unit with seven tons capacity was selected and the engine itself was picked so that additional power would be available for special operating requirements without change. The demand upon this engine is less than half of its maximum capacity, and normal operating speed is likewise much below the speed at which this engine is usually applied. It is a four-cylinder unit with a bore of 3 in. and a stroke of 4 in., and develops 18 hp. on propane gas at 1,000 r.p.m. It is equipped with its own six-volt electrical system for starting and ignition. It has full automatic pressure lubrication and is started and stopped automatically by the thermostats within the car. Safety controls stop the unit automatically if the engine overheats either from oil or water failure, and they likewise permit cranking only for a limited period in the event the fuel supply is exhausted. The Ensign gas carburetor is a simple mixing valve which has fixed jets without any adjustments. A large oil-type air cleaner is used which protects the intake from dust and increases the life of the engine. The lubricating oil is carried in the engine base which holds a supply ade-

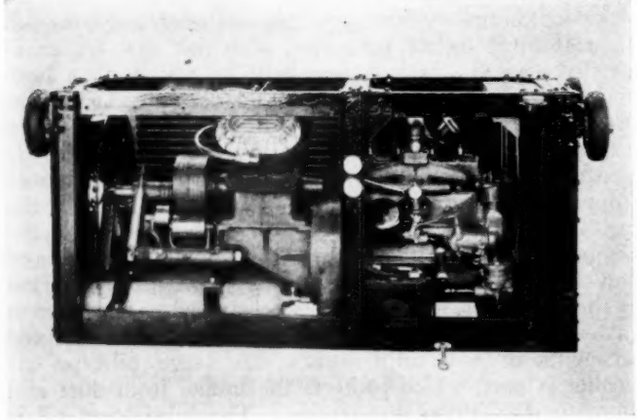


Typical Performance of Coach No. 6110 Equipped with the Waukesha Air-Conditioning Engine and Compressor Controlled by Vapor Thermostat

quate for a thousand hours of continuous operation. The fuel system, when fully charged, will operate the engine continuously at maximum capacity for 60 hr., but, as the normal cycle requires operation only a part of the time, this is equivalent to greater number of days of duty on one fueling. Thus, no time en route is required for recharging or servicing, and the unit is always available for full-capacity operation as long as there is fuel remaining in the receivers.

Unique Suspension

Special means have been taken to prevent the transmission of vibration from the unit into the car. A unique suspension has been developed which carries the entire weight of the engine-driven unit and chassis on four industrial-type pneumatic tires. These tires and their roller-bearing wheels serve the double purpose of insulating the unit from the car body and facilitating its withdrawal from under the car for inspection and servicing. It has been found, in practice, that even with the car standing in the terminal, it is hardly possible to detect whether the unit is in operation or not. Observers who have conducted the tests on this unit were required to depend upon a single light at the control cabinet for this purpose. With the use of propane and its complete, clean burning, it is said to be difficult for an observer standing beside the unit to tell whether or not it is in operation. The engine compartment is insulated by the Burgess method of sound absorption.



Covers Removed Showing the Engine and Compressor Compartments

Test Results

The following is a summary of the fuel cost in operating the Waukesha engine-driven refrigerating unit on Chicago & North Western car No. 6110. These tests, as well as the installation of the equipment, were under the direct supervision of W. E. Dunham, superintendent of the car department.

MENOMINEE RUN, TRAIN NO. 209 AND 210 (DURING JUNE, 1935)

Total miles run during test period	5,280
Total miles between Chicago and Menominee	264
Running time between terminals	7 hr. 10 min.
Total fuel (propane) used in lb.	343¼
Total fuel (propane) used in gal.	81
Lb. of fuel (propane) per 1,000 car-miles	65
Gal. of fuel (propane) per 1,000 car-miles	15.3

Note:—Outside temperature for June ranged between 69 and 84 deg. F. Propane costs $0.055 a gal. delivered in Chicago; hence: $0.055 × 15.3 = $0.87, cost of propane per 1,000 car miles.

RAPID CITY RUN, TRAIN NO. 411 AND 412 (DURING JULY AND AUGUST, 1935)

Total miles run during test period	6,946
Total miles between Chicago and Rapid City, S. D.	940
Running time between terminals	10 hr.
Total fuel (propane) used in lb.	820
Total fuel (propane) used in gal.	193
Lb. of fuel (propane) per 1,000 car-miles	118
Gal. of fuel (propane) per 1,000 car-miles	27.9

Note:—Outside temperature ranged between 77 and 98 deg. F., as indicated on the performance curve shown in one of the illustrations. Propane costs $0.055 a gal. delivered in Chicago; hence: $0.055 × 27.9 = $1.53, cost of propane per 1,000 car miles.

About one quart of lubricating oil is required for each 1,000 miles of car travel.

An interesting side light on the test occurred July 28, four miles east of Rochester, Minn., where the train was delayed for six hours by a washout. All battery-driven equipment had to be operated at reduced capacity so that the ice-activated cars would not run short of ice while the engine unit on car No. 6110 furnished cooling for the entire six hours.

Material Budgets and Surplus Topics of Prize Papers

Essay contest held by supply division—A.A.R. tests employee training in purchasing and stores work

WHILE the business of keeping up the interest of employees in railway work and providing for their proper training by positive methods has been receiving less attention since the depression than in the pre-depression years, the Purchases and Stores Division, A. A. R., has continued to hold annual competitions among the junior officers and employees of railway purchasing and stores departments for discussions on the job of supplying a railroad with material. It closed its ninth annual contest by awarding the honors for the best papers prepared in 1935 to the chief clerk to the division storekeeper of the Chicago, Milwaukee, St. Paul & Pacific, at Mason City, Iowa, and to the assistant chief clerk in the purchasing and stores department of the Gulf, Colorado & Santa Fe at Cleburne, Texas. In the two papers, entitled respectively, "Material Savings Versus Payroll Savings" and "Surplus Material," the two commentators on railway supply work laid emphasis on the opportunities that still exist for further economies in the control and use of materials by establishing a more effective understanding of the money value of material and research for the wider use of material budgets and also for the exchange of old material among the railroads. The two papers, which shared the honors equally, are presented in part as follows:

Material Savings Versus Pay-Roll Savings

By Clifton E. Oeschger

There are two ways of contributing to the economic welfare of the railroads, adding to income and reducing expenses. Labor comprises approximately 46 per cent and material approximately 27 per cent of the revenue dollar. Every man in the railroad field is conversant with the drastic reductions made in personnel and payrolls during recent years. On the other hand, material savings have not commanded the same comparative attention. Material has more generally been considered a fixed charge, in which there was little or no stretch. When a dollar is expended for material and supplies, the transaction is not immediately reflected in operating expenses, since the charge is lodged in the material and supplies account, which is also carried as an asset. Subsequently, the material finds its way through the channels of distribution, and loses, in a large sense, its semblance of exchange or cash value.

Faster Delivery

Today with its demand for getting the most out of every dollar expended and spending a lesser number of dollars, the railroads may well direct further attention to material conservation. Material that is misused or abused profits no one. The employee loses in weakening his job, the railroad loses in not being able to use that money to meet its obligations or in making necessary expenditures to improve its facilities and, as for the manufacturers of material, we need only to look back over statistics to find that the railway purchases always respond to the railway's net earnings.

A primary requisite of the storekeeper is that he shall so have the sources of supply co-ordinated that the margin of time between the users' anticipation of requirements for replacement and the storekeeper's ability to deliver the goods shall be continuously narrowed. If the stores department has not been able to speed up its service compared to a year ago, it has not progressed very far. The benefits of faster service have a direct relation to material savings. For example, if a storekeeper can guarantee delivery of a frog within a certain number of hours, there is no good reason why a trackman should carry one in stock for the protection of a very limited territory or that he should be concerned about ordering a replacement frog for delivery 30, 60 or 90 days before it will actually be needed. There is a double-barreled economy in accelerated service—getting the limit of wearing life and cutting the carrying costs of material.

Stop the Pilfering

The notion appears to exist in the minds of many that railroad property is common property. Men who would never think of robbing a bank or otherwise taking that which they do not have a right and title to apparently have no compunction about helping themselves to railroad property, principally material and supplies. The amount of pilfering losses is not definitely known, but who can dispute the charge that it is the cause of considerable inventory shortages?

The primary means of control over such losses lies in eternal vigilance and in not making railroad material easily accessible. This requires protected storage, a close time correlation of material with labor and accurate estimates of requirements. Left-overs shall be small and immediately reconsigned to the next job or back to concentration points. By keeping the material dollar locked and guarded, more pilferage losses will be eliminated.

Material Budgets Help

It will be readily agreed that pay-roll budgets, now employed by most railroads, have placed a definite control on labor expenditures. It has made every department pay-roll dollar conscious. By giving a foreman or supervisor a specified dollar-and-cent allotment to handle the physical end of his assignment, he measures his forces not so much by men as by costs, and strives for the accomplishment of the largest returns per dollar alloted. Yet it must be remembered that the material dollar weighs just as much as the pay-roll dollar. A man who is not working under a material allotment or who is not held accountable for material expenditures may not be able to judge within 50 per cent of the value of the material. It is, therefore, essential to be informed on material values. A material budget, not

only forecasts material expenditures but makes the user material-dollar-conscious. The value of new material is measured in comparison to its actual cost and brings about a closer scrutiny of misuse or abuse. Material allotments can be employed in varying degrees and the farther they are followed the more beneficial are the results.

If I interpret the relationship of the purchases and stores departments to the railroads correctly, their charge is to stand every man in his place and aid the using departments in getting the most possible value received per dollar expended. When the railroads become as material-dollar-conscious as they are pay-roll-dollar-conscious, deeper scientific studies will be made, further ways and means of material economy will be developed, restricted budgeting will set more definite limitations on expenditures, firmer economic policies will be dictated and a more thorough accounting system for measuring material dollar returns will be inaugurated.

Surplus Material

By Henry R. Kelley

The control of stocks, with the end in view of keeping therefrom surplus and obsolete materials, is one of the most important items that can engage a storekeeper's attention. The long drawn out depression, coupled with the unparalleled competition with which the rail carriers are now confronted, have combined to reduce the revenues of the railroads to the point where every nickel counts.

In studying ways and means of keeping down overhead costs, the fact is brought out that money invested in materials for which there is no present, and probably no future, use, is not only an investment which will not pay dividends, but one in which there is very little chance to salvage the amount invested, as in a large majority of cases, the material must be disposed of at a sacrifice.

Better Co-Operation

In order to appraise intelligently the value of materials released by the using departments, one must have a knowledge of the probability of its use in the future. In most instances, there is no book or library to which one can turn to secure this information. It may be arrived at only through the closest application of the storekeeper, and co-operation between the stores department and the mechanical and operating departments. The using departments should be very careful, in making up their requisitions and bills of materials, to see that only such materials as are needed are ordered. One of the most prolific sources of surplus and obsolete materials is the engineer who figures the quantity of material required for a given job and adds a percentage for good measure. It may be expensive to run short of material and have to tie up a job while additional material is obtained, but it is also expensive to accumulate material which can be used only on certain kinds of work, which may not occur again. The stores department should also be kept informed by the other departments as to the work contemplated, the equipment to be retired, etc., and if such information is not volunteered, the storekeeper must keep after it until it is secured. His task is then only begun. In a large number of stores, particularly general stores, it is a physical impossibility for the storekeeper to examine, personally, each item of material and each document covering credit allowed for material returned to stock. It is his duty, therefore, to give to his helpers all of the information which he has acquired as to the probable use for such materials, etc., and he should not only give it to them but he should insist that they make use of it.

What Credits for Surplus

But, the educational process is not enough. Where an item is returned to the custody of the storekeeper, often it is being replaced by a more advanced or up-to-date item, in which case there is little probability of its future use. If the storekeeper is not satisfied that the item is good stock, full credit should not be allowed but the material should be marked for future identification and appraised at scrap value. If a need arises for such an item, credit should then be given for its full value and the item issued the same as any other stock item. In the meantime, the effort should be made to dispose of the item to some other road. It is far easier to secure authority to dispose of it as scrap if the value is not in the stock account, thereby necessitating a charge against operating expenses. Credit that has been allowed is water over the dam, but a depreciation charge against operation is something to be remembered.

With all of the study and watchfulness, however, there will sometimes be occasion when full credit will be allowed for materials which cannot be used. These, together with material at scrap value, constitute a stock which should be disposed of to the best advantage. On another line, there may be a shortage of materials and materials which may be obsolete on one line may still be standard on others. This exchange of materials can be worked out only through the fullest co-operation between the purchasing and engineering departments of the various roads. There are undoubtedly many cases in which it is not necessary to adhere strictly to standards on a given job, and, in such cases, a little latitude by the engineering department will enable us to use many items which otherwise would have to be scrapped. These items cannot be worked off, however, even with the best of co-operation between the departments, unless the existence of such items is brought to the attention of all concerned.

Surplus stocks should be concentrated at the general store. If such materials are concentrated, it is not only easier to keep a record of the material but it is also simpler to check requisitions against such surplus stocks, thereby avoiding the purchase of new material for one point when a surplus exists at another point. When concentrated, it is comparatively simple to prepare a list of items for sale which may be submitted to a prospective purchaser. These lists should be circularized and submitted to the purchasing departments of all the various roads, and sufficient copies should be furnished to permit them to furnish copies to the using departments on their roads. By this means, the material can be brought to the attention of the parties originating the requisition, greatly assisting the purchasing department. These lists, when received, should be given more than routine attention if good results are to be obtained. The list should be kept alive and checked against requirements, as such material can be purchased more cheaply than new material from the supply houses.

Salvage Bureaus

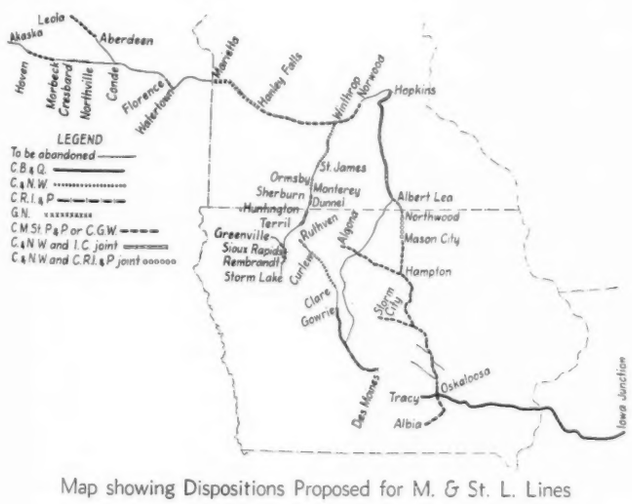
Salvage bureaus or warehouses could well be established at the larger terminals, such as Chicago, operated either by one railroad, or as a joint proposition for several roads, at which all obsolete material could be concentrated. This material should be arranged in such a manner that it could easily be inspected by prospective purchasers, and should be brought to the attention of the purchasing and engineering departments of the various

lines. If the price is attractive, no doubt a large quantity could be disposed of to the mutual advantage of the seller and the user. If a sufficient volume of such material is on hand, it would probably be advisable to employ salesmen to call on the using departments of the various roads to bring to their attention the items on hand. Such salesmen should have sufficient knowledge of the material to show their prospective customer where the material could be substituted to advantage, if not needed for the purpose for which it was originally intended. Suffice it to say that all purchase requisitions should be sent to the concentration warehouse for check before orders are placed.

Eight Roads Propose to Take Over M. & St. L.

ASSOCIATED Railways Company, 400 West Madison street, Chicago, has been organized and incorporated in Delaware by the Chicago & North Western, the Chicago, Burlington & Quincy, the Chicago Great Western, the Chicago, Milwaukee, St. Paul & Pacific, the Chicago, Rock Island & Pacific, the Great Northern, the Illinois Central and the Minneapolis, St. Paul & Sault Ste. Marie, and on September 10, applied to the Interstate Commerce Commission for permission to acquire the railroad properties of the Minneapolis & St. Louis, to abandon certain portions, to operate certain portions and to dispose of certain other portions to these railway companies. The eight railroads have agreed among themselves upon a plan of purchase at a foreclosure sale, whereby the Associated Company would bid in the property and if successful, take title. Thereafter Associated would abandon and remove certain parts of the railway lines so acquired, would execute a mortgage consisting of liens upon the lines not abandoned, and would issue and sell the bonds secured thereby to raise the necessary money for the purchase price. After the creation of this mortgage indebtedness, Associated would convey to the several participating companies the segments of the M. & St. L. assigned to them.

The terminal properties at Mason City, Iowa, would go to the Great Western (or the Milwaukee), the Rock Island and the North Western, and those at Oskaloosa, Iowa, to the Great Western (or the Milwaukee) and the Burlington as tenants in common. Associated would either retain title to the Minneapolis, Minn., terminals or convey them to the Great Western, the North Western, the Milwaukee, the Rock Island, the Illinois Central, the Burlington and the Soo. These terminals would be operated by Associated and the respective companies, each operating company having equal and common rights of user.



Map showing Dispositions Proposed for M. & St. L. Lines

Lines to Be Conveyed

The several portions of the line and railroad properties which are proposed to be conveyed to other parties are as follows:

		Miles
To North Western—Solely		
Cresbard, S. D.	Northville, S. D.	18
Florence, S. D.	Watertown, S. D.	15
Winthrop, Minn.	St. James, Minn.	45
Ormsby, Minn.	Monterey, Minn.	6
Sioux Rapids, Iowa	Rembrandt, Iowa	6
Curlew, Iowa	Clare, Iowa	34
Northwood, Iowa	Albert Lea, Minn.	16
(Trackage rights over the line of the Rock Island)		
	Total	140
To North Western jointly with Illinois Central		
Hopkins, Minn.	Albert Lea, Minn.	99
To Burlington—Solely		
Tracy, Iowa	Oskaloosa, Iowa	12
Oskaloosa, Iowa	Iowa Junction, Ill.	185
	Total	197
To Milwaukee or Great Western		
Albia, Iowa	Oskaloosa, Iowa	23
Oskaloosa, Iowa	Mason City, Iowa	145
Minerva Jct., Iowa	Story City, Iowa	35
Hampton, Iowa	Algona, Iowa	59
Ruthven, Iowa	Ayreshire, Iowa	8
Sherburn, Minn.	Dunnell, Minn.	7
Norwood, Minn.	Hanley Falls, Minn.	94
Aberdeen, S. D.	Leola, S. D.	29
Norbeck, S. D.	Hoven, S. D.	29
	Total	429
To Rock Island—Solely		
Des Moines, Iowa	Gowrie, Iowa	69
Huntington, Iowa	Terrill, Iowa	21
Greenville, Iowa	C. R. I. & P. Crossing	2
	Total	92
To Rock Island jointly with North Western		
Northwood, Iowa	Mason City, Iowa	21
To Great Northern—Solely		
Marietta, Minn.	Hanley Falls, Minn.	47

NOTE: Conveyances stated in the alternative to either the Milwaukee or the Great Western will be made to that one to which the commission shall issue its certificate of public convenience and necessity.

Abandonments

Under the plan, 507 miles of lines would be abandoned, 168 miles in South Dakota, 55 miles in Minnesota and 284 miles in Iowa. The route and termini of the portions of the line for which authority is sought to abandon are as follows:

(1) Portions of the line in South Dakota.
- (a) Approximately 19 miles from Akaska to Hoven.
- (b) Approximately 13 miles from Norbeck to Cresbard.
- (c) Approximately 24 miles from Northville to Conde.
- (d) Approximately 29 miles from Aberdeen to Conde.
- (e) Approximately 41 miles from Conde to Florence.
- (f) Approximately 42 miles from Watertown, S. D., to Marietta, Minn.

(2) Portions of the line in Minnesota.
- (a) Approximately 32 miles from Norwood to Hopkins.
- (b) Approximately 11 miles from St. James to Ormsby.
- (c) Approximately 7 miles from Monterey to Sherburn.
- (d) Approximately 5 miles from Dunnell, Minn., to Huntingdon, Iowa.

(3) Portions of the line in Iowa.
- (a) Approximately 21 miles from Terrill to Greenville.
- (b) Approximately 10 miles from C. R. I. & P. crossing to Sioux Rapids.
- (c) Approximately 12 miles from Rembrandt to Storm Lake.
- (d) Approximately 152 miles from Albert Lea, Minn., to Angus, Iowa.
- (e) Approximately 6 miles from Ayreshire to Curlew.
- (f) Approximately 22 miles from Clare to Gowrie.
- (g) Approximately 16 miles from Newburg to Van Cleve.
- (h) Approximately 14 miles from G. & M. Junction to Montezuma.
- (i) Approximately 31 miles from New Sharon to Newton.

In proposing abandonment of these portions of line, the general plan of the petitioning roads is to serve as

many towns as possible without the necessity of operating an unnecessary amount of unprofitable mileage. These roads contend that the portions of the system proposed for abandonment in whole or in part constitute the weak parts of the M. & St. L., as measured by density of traffic and station earnings per mile. It is believed that the burden of operating these parts has contributed largely to the inability of the M. & St. L. to earn revenue sufficient to support its reorganization and continuance as a separate railroad.

As bridge lines or channels for through traffic, the roads maintain that there is no public necessity, and little if any public convenience, requiring continued operation of these M. & St. L. lines, as the general territory is otherwise adequately supplied with through routes. As through routes, these lines do not fit into the system of the railroads acquiring the M. & St. L. in a manner to replace existing owned channels or with prospects of materially improving their service, increasing their revenues or of lowering their expenses of operation, and none of the acquiring roads is willing to take these parts for continued operation. The territory tributary to the lines proposed for abandonment is also served by other railroads, principally those party to the application. In addition, the territory is well supplied with highways.

It is the belief of the applicants that a considerable portion of the line to be retained would not be productive of revenue commensurate with the cost of operation, particularly when necessary expenditures for improvements are taken into consideration, but the applicants are willing to operate these lines for an experimental period. However, as to the lines proposed for abandonment, the study indicates that operation thereof would entail such losses as to defeat the plan and operations of those lines would result in such heavy losses as to be a burden upon interstate commerce.

Purchase to Cost $7,200,000

The maximum cost to Associated for the M. & St. L. would be $7,200,000, plus whatever sum may be required to discharge the existing equipment trust certificates of the railroad and its receivers. The deed of conveyance from Associated to the other parties, in accordance with the plan, would be made for a consideration of $1 in each case and subject to Associated's mortgage and the particular series of bonds thereunder which constitute a lien upon the property conveyed to each such grantee. The face amount of Associated's bonds which would constitute a lien upon the respective portions is as follows:

Grantee	Face Amount of Bonds
North Western, including its interest in the lines to be owned jointly with the Rock Island, jointly with Illinois Central, and its interest in the terminal properties at Mason City and Minneapolis	$1,189,000
Burlington, including its interest in the terminal properties at Oskaloosa and at Minneapolis	1,259,000
Great Western or Milwaukee, including interest in the terminal properties at Oskaloosa and at Mason City	1,664,000
Rock Island, including its interest in the line to be owned jointly with the North Western, and its interest in the terminal properties at Mason City and at Minneapolis	1,087,000
Great Northern, including the salvage of line from Marietta to Watertown, S. D.	107,000
Illinois Central, interest in line to be owned jointly with the North Western, and its interest in the terminal properties at Minneapolis	1,123,000
Great Western—1/7th interest in terminal properties at Minneapolis	257,000
Milwaukee—1/7th interest in the terminal properties at Minneapolis	257,000
Soo Line—1/7th interest in the terminal properties at Minneapolis	257,000
Total face value of Associated bonds	$7,200,000

Associated would issue for cash at par 80,000 shares of non-assessable common stock, par value $1 per share, with voting privileges, to the amount of 16,000 shares each to the North Western, the Burlington, the Great Western (or the Milwaukee), the Rock Island and the Illinois Central.

It would use the $80,000 to defray its expenses of organization and for working capital. It would execute and deliver a mortgage securing bonds maturing 10 years from date and bearing interest at 4 per cent per annum, each series of which would constitute a separate lien upon one of the portions of railway or undivided interest therein, or interest in terminals, sold and conveyed. It proposes to sell these bonds at par to the Reconstruction Finance Corporation and to use the proceeds thereof in payment for the lines of railway and other properties acquired by it or to reimburse its treasury for the purchase price.

Officers of the company are: Directors, F. L. Thompson, vice-president, I. C.; H. G. Clark, executive assistant to trustees, C. R. I. & P.; G. W. Hand, assistant to president, C. & N. W.; C. E. Oliphant, chief statistician, C. M. St. P. & P.; H. W. Burtness, assistant to president, C. G. W.; president, G. W. Hand; vice-president, F. L. Thompson; W. F. Peter, assistant general counsel, C. R. I. & P.; secretary, R. T. Scholes, assistant to chief engineer, C. B. & Q.; assistant secretary, E. J. Alden, assistant secretary, C. B. & Q.; and treasurer, W. Vanderpool, assistant secretary and assistant treasurer, C. R. I. & P.

The Minneapolis & St. Louis was incorporated on July 1, 1916, in Iowa. On July 26, 1923, a receiver was appointed for it by the United States district court at Minneapolis, which receivership still exists. Its owned mileage is approximately 1,515 and it has trackage rights over approximately 114 miles of line of other carriers. On May 11, 1934, the United States district court entered an order for the sale of its properties on September 5 of that year, but there were no bidders and the sale has been postponed from time to time.

New Books...

Stability of Locomotives in Operation. By Y. Rocard. Published by Hermann & Company, 6 Rue de la Sonbonne, Paris. *65 pages, 6½ in. by 10 in. Paper bound. Price, 15 francs.*

This booklet, printed in French, is a treatise—largely mathematical—of the forces acting upon a locomotive while in motion and their effect upon its stability. Among the factors considered are speeds, curves and reactions between wheels and rails. The basis of the treatise is the research work of M. Dantry of the French State Railway, which was carried on by a commission of engineers.

The Locomotive Celebrates Also. By E. Metzeltin. Published by the German Engineering Society—Vereines Deutscher Ingenieure, G.M.B.H., Berlin, N. W. 7, Dorotheenstr, 40. 88 pages, 8 in. by 11½ in. Paper bound booket. Price, 3 *Reichsmarks.*

This book, which is devoted to the part that the locomotive plays in the celebration of the German Railway Centenary, is anything but technical in its treatment of the subject. The text contains much of wit, jokes, caricature and ridicule, as well as praise of the locomotive. The 177 illustrations, a number of them cartoons, well depict the evolution of the locomotive from its infancy to the present day. There is also an interesting collection of opinions expressed by prominent people from 1802 till 1935, which forms a mirror of the times, although often a distorted one. While devoted largely to the German locomotives, the rest of the world has not been overlooked. Mention and frequent illustration is made of interesting or freak locomotives in other parts of the world, several of them being of American origin. The book should be of interest not only to engineers, but also to anyone interested in the part played by the locomotive in the past and the present and who has even a slight knowledge of German.

NEWS

Inland Waterways Corp. Annual Report for 1934

Deficit was $920,147 but Ashburn says this year has brought swing from red to black

The annual report of the Inland Waterways Corporation for the calendar year 1934, showing a net deficit for the year of $920,147 and a debit balance at the end of the year of $504,890, was made public by the War Department on August 26, dated May 29. The part of the report signed by General T. Q. Ashburn, president of the corporation, is very short and said that the report had been somewhat delayed pending the receipt of the accountants' certificate of Haskins & Sells; also that since the beginning of the year "the corporation has again swung from the red to the black." At the time of submitting the report, he said, the reserve fund had increased by $422,037 over the available reserve fund of December 31, 1934.

In explanation of the deficit General Ashburn said that the general policy of keeping as many men employed as possible, so long as funds therefor did not seriously reduce the surplus of the corporation, was followed in 1934 as in 1933, but that the general depression affected all forms of transportation so seriously that at a meeting of the advisory board in November, attended by the Secretary of War, "ways and means of stopping a continued drain upon the reserve of the corporation were discussed and the president was directed to effect a reorganization which would, as far as practicable, accomplish three things: (a) Reduction of overhead. (b) Increase in volume of freight. (c) Increase in revenue per ton. "The undersigned is happy to state," he added, "that through the reorganization made effective January 1, 1935, the corporation has again swung from the red to the black, and is receiving surplus money derived from operations, rather than disbursing from its reserve to carry on such operations. The corporation has consistently advocated the regulation of all means of transportation, through the medium of a reorganized Interstate Commerce Commission, and a declaration of policy by the Congress to support and develop all forms of transportation so that the public may have at its disposal the best and cheapest form of transportation available."

Results of the operations of the Federal Barge Lines for 1934 as reported to the Interstate Commerce Commission were shown in the *Railway Age* of August 17, page 225. The pamphlet report includes a consolidated statement for the system showing a reduction in tonnage and revenues but an increase in expenses, in somewhat different figures as shown in the accompanying table.

An extract from the report of L. D. Chaffee, traffic manager, said that "during the calendar year 1934 losses in tonnage and revenues as compared with previous years may be attributed to more favorable rates offered by other carriers, attempts on the part of shippers to obtain reductions in rates through diversion of freight to other routes, and the activities of rail lines in eliminating differentials by reducing rail rates and declining to join in corresponding reductions in the joint rail-and-water rates. Loss of tonnage, of course, meant loss of revenue and the most important losses of revenue were due to rate reductions made to meet reductions put into effect by other carriers."

FEDERAL BARGE LINES
(All Divisions Combined)

	1934	1933	1934 increase (+) decrease (−)
Tonnage transported	1,483,859	1,605,830	−121,971
Total revenues	$4,376,216.50	$5,085,210.84	−$708,994.34
Total expenses	5,296,364.45	5,055,161.73	+241,202.72
Net income	*$920,147.95	$30,049.11	−$950,197.06
Depreciation included in expenses	618,014.20	627,921.06	−9,906.86
Income before depreciation	*$302,133.75	$657,970.17	−$960,103.92
Averages per ton:			
Revenues	$2.95	$3.17	−$0.22
Expenses	3.57	3.15	+0.42
Net income	*$0.62	$0.02	−$0.64

* Loss.

Trucking Interests Have Varying Views on Rates

Recent Chicago meetings reveal that question continues to be a controversial one

The basis for truck rates continues, as was the case during the two years in which the code was in effect, to be one of the outstanding controversies among truck operators and has become an important factor in the success of federal regulation. Some truckers favor the development of freight transportation rates on reasonable trucking operating costs plus a reasonable profit and applied under a truck classification of commodities. Others advocate the adoption of railroad classification as a basis for truck rates and the making of truck rate structures based on rail class rates.

Illinois members of the American Trucking Associations, Inc., at a meeting in Chicago on September 5, ratified the resolution adopted by the rates and tariffs committee of the association favoring the cost basis, the vote being 96 for, 3 against and 18 not voting, but at the same time strong pleas were made from the floor for the adoption of railroad classifications.

While the meeting was intended to bring about an agreement of interests on the cost basis for truck rates as proposed by the association, nothing definite was accomplished. A classification plan was proposed by some Illinois members which divides all freight into three classes, with a restricted list of light-weight commodities placed in one class, a restricted list of heavy-weight commodities placed in another class and all other freight in another class. No definite action was taken on this or a number of other proposals.

At a meeting of the fourth region of the association at Chicago on the following day, the members from Illinois, Indiana, Iowa, Ohio, Missouri, Michigan and Wisconsin were likewise divided between the cost basis of rate making favored by the association, the proposal to use the rail classification and the Illinois classification plan and failed to agree on a basis for making truck rates. A national committee of the association representing the freight truckers of the various states met in Washington, D. C., on September 12. It will file with the commission before the end of the month rate schedules for each of the eight regions.

Members of the Central Motor Freight Association representing 400 truckers in the Chicago area, at a meeting at Chicago on September 13, voted to set up a bureau for the filing of rates.

Railroad Day at Machine Tool Show September 20

Program for this ten-day exposition includes special features for railway men

One of the innovations of this year's machine tool show which opened on September 11 at the Cleveland Public Auditorium for a ten day period will be Railroad Day. The Exposition Committee has set aside Friday, September 20, as a special railroad day in honor of the railroad officers and supervisors who will attend the show. Many exhibitors plan on that day to have railroad job operations set up for demonstration purposes on their machines so that the visitors may have an opportunity to learn at first hand what a modern machine can do by comparison with the tools now in service in railroad shops.

This year's machine tool show—the first in six years—will afford mechanical department executives, shop superintendents, supervisors and others whose duties bring them into contact with shop operations, an opportunity to review the progress that has been made in the design of shop machinery and equipment. This is expected to be the largest machine tool exposition which has ever been held and will include 900 metal working machines of 600 types spread out over a quarter of a million square feet of floor space. The machine tools, together with exhibits of small tools, gages, accessories and shop equipment, will represent a value of over $4,000,000.

That this show holds much of interest for railroad men is indicated by the fact that of more than 110 machine tool manufacturing companies having space an analysis of the list shows that 75 companies are well known in the railroad field and will have in operation at the show the most efficient machines which their engineers and craftsmen have been able to produce, as the industry's contribution to the cause of better shop workmanship and lower costs. In addition there are over 100 more exhibitors of small tools, accessories and shop equipment.

Machine Tool Congress

Machine tool production problems and machine shop practices will be analyzed and discussed by experts during the course of the sessions of the eight-day Machine Tool Congress to be held each evening in conjunction with the Machine Tool Exposition. The meetings will deal with such subjects as metal cutting with modern machines and tools, surface finishing, rust-proofing and welding, and will be conducted under the direction of the American Society of Mechanical Engineers, Society of Automotive Engineers, American Society of Tool Engineers, the Cleveland Engineering Society and the National Machine Tool Builders' Association. The purpose of these meetings is to provide a forum wherein engineers, users and producers may discuss freely all questions of mutual interest concerning the design and utilization of machine tools.

The show is under the direction of the Exposition Committee, the members of which are W. P. Kirk, vice-president, Pratt & Whitney Company, Hartford, Conn., chairman; George L. Erwin, Jr., sales manager, Kearney & Trecker, Milwaukee, Wis.; J. G. Hey, vice-president, Avey Drilling Machine Company, Cincinnati, Ohio; Norman D. MacLeod, president, Abrasive Machine Tool Company, East Providence, R. I.; and W. E. Whipp, president, Monarch Machine Tool Company, Sidney, Ohio. Charles J. Stilwell, vice-president, Warner & Swasey Company, Cleveland, Ohio, is president of the association.

Highway Accidents Costing 2½ Billions

Highway accidents have risen to a point where they are costing the United States more than $2,500,000,000 a year, Professor S. S. Steinberg, of the University of Maryland, president of the educational division of the American Road Builders' Association, declared today (September 3) in a speech delivered over the nation-wide network of the Columbia Broadcasting System.

—From the New York Herald Tribune.

Power Reverse Gear Case Hearings October 29

Interstate Commerce Commission hearings in the power reverse gear case, recently postponed from September 17 to October 22, as announced in the *Railway Age* of September 7, have been further postponed to October 29, according to a later announcement by Commissioner McManamy.

Trans-Missouri-Kansas Shippers' Board

The forty-third regular meeting of the Trans-Missouri-Kansas Shippers' Board will be held at St. Louis, Mo., on September 18. Besides the reports of various committees, the program will include an address on the Federal Co-ordinator's freight traffic report by J. R. Turney, former director, Section Transportation Service, Federal Co-ordinator of Transportation, and a general discussion of this report. At a luncheon, Thomas B. Huff, president of the Transportation Association of America, will be the principal speaker.

Western Pick-Up and Delivery Service

At a meeting of western traffic officers in Chicago on August 26, the general principle of pick-up and delivery for merchandise freight was approved, but it was agreed that factors of truck and canal competition and differences in traffic densities make it inadvisable to set a uniform standard of services and rates throughout western territory. As a result, Western lines will continue their policy of instituting merchandise class rates, including pick-up and delivery, at specific points as conditions seem to warrant, with a 5-cent allowance each to the shipper and the consignee where either or both perform the services themselves.

Rules for Federal Grade Crossing Work Altered

Amendment, removing high labor requirements, gives hope of extensive activity

Fundamental changes in the rules and regulations laid down to cover the work of eliminating and protecting railway-highway grade crossings, and also the reconstruction of existing grade separation structures, to be carried out with federal funds appropriated under the Emergency Relief Appropriation Act of 1935, which, it would appear, clear the way for large-scale operations generally throughout the country, are contained in Amendment No. 1 to the original rules and regulations, issued by the Acting Secretary of Agriculture on August 29. By this amendment, Section 6, "Basis of Approval of Projects," is revoked in its entirety. This section, which has been considered quite generally by highway and railway engineers as an obstacle to carrying out any large-scale grade crossing elimination or protection program with the $200,000,000 appropriated specifically for this purpose, stated that all projects proposed would be measured for approval on the basis of—(1) providing the equivalent of a man-year of employment on the project at a total cost to the federal government, including labor, materials and all other items properly chargeable to the work, of not exceeding $1400 per man-year, or (2) that 40 per cent of the total cost of the project, including the cost of private property necessary to acquire in undertaking a project (cost of private property excluded later) go to persons directly employed on the project.

Section 22 of the rules and regulations—"Alternate Plan for Utilization of Works Program Grade Crossing Funds," under which grade crossing work in a state would be relieved of the requirements of Section 6 if the state guaranteed to underwrite employment of those on its relief rolls at least to the extent that would result if the requirements of Section 6 were maintained in full effect, is also revoked in its entirety by Amendment 1.

Section 12, "Employment of Labor," is changed by Amendment 1 in two respects. The revised paragraph with regard to the employment of those on public relief rolls, reads as follows: "Contracts for all projects shall provide that, except in executive, administrative, supervisory and highly skilled positions, only persons certified for assignment to work by the United States Employment Service shall be employed, and that preference in the employment of persons certified by the United States Employment Service shall be given, when they are qualified, to those on public relief rolls."

The main difference in the above paragraph from that which it supersedes in Section 12 is that it does not contain the clause that "at least 90 per cent of all persons working on a contract shall have been taken from public relief rolls."

The only other important change in Section 12 is the elimination of the require-

ment that only one member of a family group may be employed under a contract, except as authorized specifically by the Secretary of Agriculture.

One new section, No. 31—"Violation of Rules and Regulations" is added by Amendment 1. This section is as follows: "Any contractor who deliberately violates the spirit and intent of these rules and regulations or the special provisions issued thereunder shall not be eligible to bid upon any further work involving the use of Works Program Grade Crossing Funds."

An Amendment No. 1 has also been made to the rules and regulations for carrying out the provisions of the Emergency Relief Appropriations Act of 1935 as they relate specifically to the construction of public highways and other related projects. Under it, however, there is no release from the requirement that all highway projects proposed shall be measured for approval on the basis of providing the equivalent of a man-year of employment on the project at a total cost to the federal government, including labor, materials and all other items properly chargeable to the work, of not exceeding $1400 per man-year. Furthermore, Amendment No. 1 to the rules and regulations governing highway work makes no fundamental change in that section of these rules providing for an alternate plan for utilization of Works Program Highway Funds, which section stands essentially similar to the corresponding section revoked in the rules and regulations governing grade crossing elimination and protection work.

Commenting upon the changes in the rules and regulations and special provisions governing grade crossing and highway projects, Thomas H. MacDonald, chief of the Bureau of Public Roads, in a memorandum to the district engineers of the Bureau, says that these provide a thoroughly workable basis for the employment of labor. He points out that projects should continue to be selected with respect to undertaking desirable improvements, especially in areas where large unemployment exists, and that data furnished by the Emergency Relief Administration with respect to the relief load in the various counties of a state shall be used to the extent possible as a basis of selection.

New York Railroad Club

The first Fall meeting of the New York Railroad Club will be held on Friday, October 18, at the auditorium of the Engineering Societies building, 29 West Thirty-ninth street, New York.

N. & W. Veterans

The Norfolk & Western Veterans' Association includes a Colored Division, 300 members of which held their fourth annual convention and dinner on August 31 at Ocean Breeze, near Norfolk, Va. Holcombe Parkes, representing President A. C. Needles, made a short address, as did also Hon. Arthur W. Mitchell, colored congressman from Illinois, and W. B. Carter, president of the Association. Major Walter R. Brown, dean of men at Hampton Institute, led the singing. Mr. Parkes presented the association's diamond insignia to James E. Leftwich, of Bluefield, W. Va., retired brakeman, who has served the road 52 years and 9 months.

R. C. C. Has Returned 35 Per Cent

The Railroad Credit Corporation has returned to the carriers $25,755,974, or 35 per cent of the fund administered by it, according to report filed September 6 with the Interstate Commerce Commission, $11,665,286 having been paid in cash and $14,090,688 credited on obligations due the Corporation. The twentieth liquidating distribution was made on August 31, returning $735,879, or the equivalent of 1 per cent of the carriers' net contributions to the fund.

E. G. Buckland, president of the corporation, said that collections in August totalled $395,126, including $388,675 payments in reduction of loans, and $6,451 interest.

Soil Improvement Car

Mention was made in the *Railway Age* of July 6, page 24, of the soil improvement car which is being operated by the Nashville, Chattanooga & St. Louis Railway in the states of Tennessee and Kentucky. This car was visited by 1,670 people between July 1 and August 16, inclusive. Farmers to the number of 460 brought samples of soil with them. A total of 7,294 soil samples was tested. For the lime test 4,365 samples showed acid, as compared to 607 sweet. As a result of these tests it is expected that 3,161 acres will be limed in 1935. Only 183 tests showed that the soils were rich in phosphate, while 2,139 tests indicated that the soils were deficient in this respect.

Pullman Opens New Travel Bureau

As a result of the success in the last four years in demonstrating its accommodations to a half-million people in Chicago, the Pullman Company has broadened its program to include gratuitous helpfulness to travelers planning trips by way of railroads and Pullman. To accomplish this, it has opened a ticket office with its travel bureau in the Pullman building, 208 South Michigan avenue, and has enlarged and improved its display of Pullman accommodations. The bureau will give information regarding journeys in any part of the United States, Canada or Mexico, to be taken by way of railroads and Pullman, including tours operated by railroads and responsible tour companies; and also rail and water journeys. Pullman tickets will be issued, and railroad tickets will be secured for patrons.

More than 100,000 persons have visited annually the display room in the Pullman building since it first opened in March, 1931.

The display space has been redesigned and redecorated and equipped with chairs and writing desks for visitors.

Illinois Terminal Reduces Coal Rates

Subject to final approval by the Illinois Commerce Commission and the Interstate Commerce Commission, the Illinois Terminal Railway System will on October 1 reduce the freight rate on coal shipments to meet truck competition, the new rates applying from the principal coal-producing points along the railroad within a radius of 30 miles of East St. Louis, Alton, Wood River and Roxana, Ill. Under the new tariffs the rate to St. Louis is cut from $1.15 to 80 cents a ton, while the East St. Louis rate will be 55 cents instead of 85 cents. It has been estimated that during the last year motor trucks carried approximately 1,800,000 tons of coal from mines served by the Illinois Terminal.

Freight Revenue and Value of Commodities Transported

The Interstate Commerce Commission made public last week a tabulation showing freight revenue and value of commodities transported on Class I railways in 1933. This tabulation, which was prepared by Dr. M. O. Lorenz, director of statistics, shows that of $24,198,234,000, the total value at destination of commodities carried, freight charges amounted to $2,578,984,000 or 10.66 per cent of value.

"The corresponding figures," the announcement said, "in the study for 1930 (revised) were $63.09 billions for total value, $4.21 billions for revenues, with a ratio of 6.7 per cent. The change is the net result of lower commodity prices without a corresponding change in freight rates and also of some differences in method of

Indirect Lighting Is Used in the Bureau

compilation and in proportions of various commodities carried. In 1934 commodity prices increased and it is probable that a similar compilation would again reduce the percentage of freight charge to value to approximately 9 per cent. If the comparison is made, not between freight charge and destination value as above, but between the freight charge and value excluding the aggregate freight charge, the ratio for 1933 would be 11.9 per cent."

Wage Statistics for June

Class I railroads excluding switching and terminal companies have reported to the Interstate Commerce Commission a total of 1,014,977 employees as of the middle of June and a total compensation of $137,297,176. This was 39,449 or 3.74 per cent less than the number reported for June, 1934. The total number of hours paid for was 5.13 per cent less and the total compensation 5.99 per cent greater in June, 1935, than in June, 1934, reflecting the higher basis of wages paid since April 1. A comparison of the number of employees who received pay during the month, 1,132,788, with the total hours paid for, shows 180 hours per employee in June, 1934, and 176 in June, 1935, or a decrease of 2.22 per cent.

August Business Highest on Hiawatha

A total of 25,003 revenue passengers (807 per day) were carried in August on the Hiawatha, operated by the Chicago, Milwaukee, St. Paul & Pacific between Chicago and the Twin Cities, as compared with 20,237 in July and 16,564 in June. Northbound in August the train carried 12,559 persons and southbound, 12,444. The August business represents a daily increase of 154 passengers over July, and of 255 over June. The highest number carried in one day was on August 31: 912 northbound and 720 southbound. On six different days, more than 1,000 were carried. On 25 days in August, the business of the Hiawatha required the operation of one or more extra sections, while on August 31 there were three sections out of Chicago and two out of St. Paul.

Great Western of Great Britain Celebrates Centenary

The Great Western of Great Britain is at this time celebrating the 100th anniversary of its existence as an incorporated company. While the first section of the line was not open to the public until June 4, 1838, it was on August 31, 1835, that an act of Parliament authorizing the construction of the Great Western received the Royal assent. The Railway Gazette (London) in a supplement to its August 30 issue has published a Special Centenary Number in commemoration of the G. W. R. anniversary. Sir James Milne, general manager of the Great Western, in a foreword to this number, says that in the century the road has grown from 116 miles of single track to 9,075 miles and that its capital investment has risen from £2,000,000 to over £183,000,000.

"Many struggles, disappointments, and triumphs stand out as milestones in the company's history," Sir James continued, "but probably the most important of these was the radical alteration brought about by the Railways Act, 1921. This led to the grouping of the railways and to the extinction of the old companies, with the exception of the Great Western, which absorbed 32 separate concerns, and alone retained the privilege of using its own name in the amalgamations which followed."

The general manager also pointed out how "enterprise has for long been a marked characteristic of Great Western activities," citing in this connection that the road operates the largest number of steam services at over-all speeds exceeding 60 m.p.h.; that it may claim to have initiated many innovations such as the introduction of passenger motor bus services, the use of containers for merchandise traffic, the principle of registered shipments, and the first railway air service.

Ruling Made in Denver Car Spotting Case

In a suit filed by the Amato Fruit & Produce Company in Denver, Colo., against the Union Pacific, in which the produce company claims that the price at which it had been selling grapefruit dropped 50 cents a box between the time a certain shipment arrived and the time the consignee was permitted to unload it, or a total of $182.50, Justice of the Peace Henry S. Lindsley ruled that the road should pay the loss.

The case is the outgrowth of efforts of Denver merchants to force the railroads to spot cars as they arrive instead of according to the road's plan whereby shipments which arrive after 7 a. m. on certain fast trains cannot be unloaded until 5:30 p. m., or at the same time as those arriving on slower trains. Attorneys for the railroads have appealed the decision.

Net Deficit for Six Months $62,025,201

Class I railroads for the first six months of 1935 had a net deficit of $62,025,201 after interest and other fixed charges, as compared with a deficit of $23,162,614 in

SELECTED INCOME AND BALANCE-SHEET ITEMS OF CLASS I STEAM RAILWAYS

Compiled From 143 Reports (Form IBS) Representing 149 Steam Railways

TOTALS FOR THE UNITED STATES (ALL REGIONS)

For the month of June 1935	For the month of June 1934	*Income Items*	For the six months of 1935	For the six months of 1934
$34,024,695	$42,037,757	1. Net railway operating income	$194,812,678	$226,867,029
16,597,947	21,075,926	2. Other income	80,197,340	89,176,064
50,622,642	63,113,683	3. Total income	275,010,018	316,043,093
1,550,226	1,801,041	4. Miscellaneous deductions from income	8,841,054	10,723,814
49,072,416	61,312,642	5. Income available for fixed charges	266,168,964	305,319,279
		6. Fixed charges:		
11,111,206	11,279,051	6-01. Rent for leased roads	66,216,840	66,630,650
42,001,785	42,486,897	6-02. Interest deductions	253,772,128	253,575,193
223,304	240,054	6-03. Other deductions	1,345,542	1,484,037
53,336,295	54,006,002	6-04. Total fixed charges	321,334,510	321,689,880
§ 4,263,879	7,306,640	7. Income after fixed charges	§ 55,165,546	§ 16,370,601
1,139,185	1,129,002	8. Contingent charges	6,859,655	6,792,013
§ 5,403,064	6,177,638	9. Net income‡	§ 62,025,201	§ 23,162,614
		10. Depreciation and retirements (equipment only)	96,455,410	95,314,893
16,150,465	15,898,961	11. Federal income taxes	8,599,459	9,283,250
1,393,650	1,424,390	12. Dividend appropriations:		
7,994,725	12,600,909	12-01. On common stock	39,945,366	49,924,718
335,929	3,978,131	12-02. On preferred stock	8,181,411	8,816,074

Selected Asset Items	Balance at end of June 1935	Balance at end of June 1934
13. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)	$737,648,169	$759,791,867
14. Cash	$379,701,822	$305,385,624
15. Demand loans and deposits	11,200,532	37,895,128
16. Time drafts and deposits	24,715,593	41,001,913
17. Special deposits	77,466,622	68,197,420
18. Loans and bills receivable	4,100,467	6,399,697
19. Traffic and car-service balances receivable	56,406,016	54,037,909
20. Net balance receivable from agents and conductors	44,750,356	43,236,334
21. Miscellaneous accounts receivable	138,124,087	145,884,568
22. Materials and supplies	301,910,912	308,322,098
23. Interest and dividends receivable	35,062,067	42,220,404
24. Rents receivable	2,363,242	2,607,796
25. Other current assets	4,502,665	4,357,316
26. Total current assets (items 14 to 25)	$1,080,304,381	$1,059,546,207
Selected Liability Items		
27. Funded debt maturing within 6 months*	$160,227,348	$43,797,837
28. Loans and bills payable†	$342,192,106	$320,283,337
29. Traffic and car-service balances payable	72,273,453	69,960,622
30. Audited accounts and wages payable	224,127,540	224,138,629
31. Miscellaneous accounts payable	64,451,848	55,337,397
32. Interest matured unpaid	382,669,463	299,094,626
33. Dividends matured unpaid	13,900,655	13,739,094
34. Funded debt matured unpaid	331,374,336	275,643,721
35. Unmatured dividends declared	10,940,942	10,597,512
36. Unmatured interest accrued	92,659,149	92,242,098
37. Unmatured rents accrued	23,582,471	22,540,376
38. Other current liabilities	23,264,064	22,230,755
39. Total current liabilities (items 28 to 38)	$1,581,436,027	$1,405,808,167
40. Tax liability (Account 771):		
40-01. U. S. Government taxes	$34,782,238	$34,178,677
40-02. Other than U. S. Government taxes	137,548,392	142,776,178

* Includes payments which will become due on account of principal of long-term debt (other than that in Account 764, Funded debt matured unpaid) within 6 months after close of month of report.

† Includes obligations which mature less than 2 years after date of issue.

‡ June, 1935, income, as reported, was increased by credits to operating expenses on account of reversal of charges previously made for liability under Railroad Retirement Act. These credits for June, 1935, amounted to $1,080,089, and for the 6 months ended with June, 1935, the net credit is $5,605,911.

§ Deficit.

NET INCOME OF LARGE STEAM RAILWAYS WITH ANNUAL OPERATING REVENUES ABOVE $25,000,000

Name of Railway	Net income after depreciation and retirements, For the 6 months of 1935	Net income after depreciation and retirements, For the 6 months of 1934	Net income before depreciation and retirements, For the 6 months of 1935	Net income before depreciation and retirements, For the 6 months of 1934
Alton R. R.	*$1,389,423	* $911,184	*$1,231,716	* $825,862
Atchison, Topeka & Santa Fe Ry. System†	1,424,398	1,166,402	7,130,360	6,878,401
Atlantic Coast Line R. R.	* 450,409	1,172,047	691,616	2,222,119
Baltimore & Ohio R. R.	* 2,496,157	* 2,400,706	954,371	1,435,149
Boston & Maine R. R.	* 283,145	* 568,848	547,083	236,542
Central of Georgia Ry.	* 1,479,985	* 1,468,076	* 1,072,817	* 1,073,201
Central R. R. of New Jersey	* 516,746	7,376	324,238	1,074,404
Chesapeake & Ohio Ry.	13,487,586	13,976,822	17,614,112	17,501,129
Chicago & Eastern Illinois Ry.	* 854,658	* 991,762	* 549,245	* 764,228
Chicago & North Western Ry.	* 6,814,307	* 5,708,466	* 4,228,782	* 3,441,061
Chicago, Burlington & Quincy R. R.	* 3,542,392	* 157,533	* 990,552	1,441,487
Chicago Great Western R. R.	* 962,333	* 614,168	* 700,636	* 358,512
Chicago, Milwaukee, St. Paul & Pacific R. R.	*10,309,417	* 8,734,700	* 7,484,666	* 5,281,288
Chicago, Rock Island & Pacific Ry.	* 8,697,785	* 6,281,539	* 6,447,619	* 3,890,269
Chicago, St. Paul, Minneapolis & Omaha Ry.	* 1,575,359	* 1,038,243	* 1,259,287	* 760,158
Delaware & Hudson R. R.	* 1,050,626	* 1,035,450	* 547,764	* 489,108
Delaware, Lackawanna & Western R. R.	* 883,620	* 180,965	476,931	1,087,460
Denver & Rio Grande Western R. R.	* 2,583,611	* 1,650,993	* 1,987,179	* 1,141,313
Elgin, Joliet & Eastern Ry.	900,105	* 44,136	1,348,770	415,186
Erie R. R. (including Chicago & Erie R. R.)	* 668,000	881,335	1,407,000	3,188,701
Grand Trunk Western R. R.	* 193,666	* 281,803	343,650	183,682
Great Northern Railway	* 3,298,082	* 4,475,436	* 1,596,805	* 2,677,377
Illinois Central R. R.	* 2,155,474	* 680,273	1,303,609	2,676,592
Lehigh Valley R. R.	* 17,234	* 319,106	788,192	679,314
Long Island R. R.	* 881,990	* 228,753	* 337,035	265,969
Los Angeles & Salt Lake R. R.	* 191,375	162,158	190,213	495,584
Louisville & Nashville R. R.	1,465,021	2,097,052	3,611,849	4,183,047
Minneapolis, St. Paul & Sault Ste. Marie Ry.	* 3,480,068	* 3,061,914	* 2,933,505	* 2,336,301
Missouri-Kansas-Texas Lines	* 2,704,736	* 1,422,340	* 2,052,981	* 939,566
Missouri Pacific R. R.	* 8,775,857	* 6,281,267	* 6,589,917	* 3,888,894
New York Central R. R.‡	* 4,160,013	* 1,613,334	4,162,485	6,038,577
New York, Chicago & St. Louis R. R.	7,465	413,343	833,050	1,094,288
New York, New Haven & Hartford R. R.	* 1,613,930	* 1,424,674	116,312	584,641
Norfolk & Western Ry.	9,934,057	10,615,481	11,996,719	13,063,253
Northern Pacific Ry.	* 6,504,464	* 2,478,341	* 4,870,425	* 1,042,166
Oregon Short Line R. R.	* 343,724	* 209,102	161,496	281,941
Oregon-Washington R. R. & Navigation Co.	* 2,148,592	* 1,847,722	* 1,851,143	* 1,568,584
Pennsylvania R. R.	9,700,868	11,532,478	19,988,001	21,973,539
Pere Marquette Ry.	337,177	575,175	1,627,157	1,704,103
Pittsburgh & Lake Erie R. R.	1,340,521	1,505,133	2,249,935	2,675,892
Reading Co.	2,587,038	3,775,212	4,084,925	5,350,056
St. Louis-San Francisco Ry.	* 6,416,747	* 4,394,932	* 8,454,950	* 2,821,451
St. Louis Southwestern Lines	* 299,298	* 444,272	13,590	* 185,479
Seaboard Air Line Ry.	* 3,197,630	* 2,991,082	* 2,263,506	* 2,110,747
Southern Ry.	* 2,545,610	* 1,168,339	* 1,137,827	391,061
Southern Pacific Transportation System§	* 3,330,967	* 2,506,477	412,201	1,344,954
Texas & Pacific Ry.	106,606	295,679	710,565	896,964
Union Pacific R. R.	6,146,075	8,367,969	8,151,641	10,542,486
Wabash Ry.	* 1,588,022	* 1,401,744	* 504,375	* 511,428
Yazoo & Mississippi Valley R. R.	* 972,259	* 1,100,661	* 708,914	* 828,697

† Includes Atchison, Topeka & Santa Fe Ry., Gulf, Colorado & Santa Fe Ry., and Panhandle & Santa Fe Ry.
‡ Includes Boston & Albany, Michigan Central, and Big Four Lines, lessors to New York Central R. R.
§ Includes Southern Pacific Company and Texas & New Orleans R. R.
* Deficit.

the corresponding period of last year, according to the Interstate Commerce Commission's monthly compilation of selected income and balance-sheet items. For June there was a deficit of $5,403,064, as compared with a net income of $6,177,638 in June, 1934.

Opposition to Long Island Fare Increase Proposal

The Nassau County (Long Island, N. Y.) Village Officials' Association, at a meeting on September 11 attended by representatives of 59 villages, voted to levy a poll tax of $2 against each citizen to finance that county's share of the Long Island commuters' case in opposition to the fare increase recently proposed by the Long Island Railroad. On the same day, another move in opposition was taken by commuters from Queens, Nassau and Suffolk counties who voted to promote the creation of a "Long Island Rapid Transit Authority" with power to take over and operate the Long Island.

The Nassau county tax, it is expected, would raise approximately $500,000 to finance the employment of specialists to prepare a case against the proposed rate increase. The transit authority plan is said to have been first suggested by former State Senator John A. Hastings, the author of a recently-published plan for the "postalizing" of transportation.

Meanwhile the Transit Commission of New York City adopted an order setting September 30 as the time for the hearing on the application of the Long Island for authority to increase its commutation rates.

Club Meetings

The Traffic Forum of the Traffic Club of Newark (N. J.) will hold its first Fall meeting on September 20 at the Newark Athletic Club. This meeting will inaugurate the first of a series of "Railroad March of Time" programs which the Forum plans for the coming season. The Forum is designed to promote among its members a better understanding of all phases of freight transportation—railway, steamship, motor truck and airway.

The Richmond (Va.) Traffic Club will hold its first Fall meeting on Monday, September 16, at the Hotel John Marshall in that city. The speaker will be Joe Marshall, special representative, Freight Claim division, Association of American Railroads.

The New York division of the Railroad Enthusiasts, Inc., will hold its first indoor meeting of the Fall season on September 21 at the club's rooms in Grand Central Terminal. The tentative program calls for an address to be delivered by R. H. Pusch, general passenger agent of the New York, New Haven & Hartford. The regular monthly inspection tour of this organization was held on September 7, when members were the guests of the Pennsylvania at its Sunnyside (N. Y.) yards.

New Equipment Installed

New freight cars installed by the Class I railroads in the first seven months of 1935 totaled 2,272, according to the Association of American Railroads. In the same period last year, 9,483 new freight cars were placed in service, and, in the same period two years ago, there were 1,391. Twenty-seven new steam locomotives and 99 new electric locomotives were placed in service in the first seven months of this year. In the first seven months of 1934, six new steam locomotives and eight new electric locomotives were installed.

New freight cars on order on August 1 totaled 2,174 compared with 13,755 on the same day in 1934 and 1,187 in 1933. Four new steam locomotives and four new electric locomotives were on order on August 1, as compared with 35 steam locomotives and 107 electric locomotives on order on August 1, 1934. Freight cars and locomotives leased or otherwise acquired are not included in the above figures.

Western Society of Engineers Elects Secretary

Leigh S. Keith has been appointed secretary of the Western Society of Engineers, Chicago, effective September 1, succeeding Edgar S. Nethercut, who has retired at his own request and who has been elected secretary emeritus after 18 years' service as secretary and director. Mr. Keith graduated from the Massachusetts Institute of Technology in 1900, since which time he has been engaged in consulting engineering practice in the public utility and industrial fields. Mr. Nethercut graduated in civil engineering from the University of Wisconsin in 1889. He was for 16 years connected with the Paige Iron Works and the Buda Company, rising to the positions of chief engineer, sales engineer and director. Mr. Nethercut entered the field of consulting engineering in 1907, specializing in utility valuation. He was elected secretary of the Western Society of Engineers in 1917.

C. & N. W. Fast Trains Have Increased Business in August

The "400" and the "Flambeau," high speed trains of the Chicago & North Western, during August, broke all their previous records for passengers carried. The "400," between Chicago and the Twin Cities, carried 1,085 more passengers in August than in February, its previous high month. The increase is more striking because February was a month in which this was the only mile-a-minute train between these cities. The "Flambeau," a fast Friday afternoon train to the north woods of Wisconsin, which was put on as an experiment, has been run in two sections out of Chicago every Friday since July 19. On the Friday before Labor Day, there were nearly 400 passengers. A survey of pas-

sengers on the Flambeau, which will be operated throughout September, reveals many people who formerly drove their cars to the north woods. The train returns every Sunday afternoon.

Pennsylvania Station, N. Y., Opened Twenty-five Years Ago

Pennsylvania Station, New York, on September 8 celebrated the twenty-fifth anniversary of its opening. The first regular trains to be operated out of the station were run over the Long Island on September 8, 1910, and thus after nine years of construction on the tunnels under the North and East rivers, and six and one-half years on the terminal itself, the new facilities were available to extend the services of the Pennsylvania and the Long Island to Manhattan. It was, however, eleven weeks after the services were inaugurated on the Long Island that trains of the Pennsylvania commenced operation through the North river tunnel.

The planning of Pennsylvania Station, together with the engineering work involved in the tunneling of the Hudson river, Manhattan Island and the East river for the purpose of giving the Pennsylvania a passenger terminal in the heart of New York City, and an outlet to Long Island, New England and Canada, was the vision of Alexander Johnston Cassatt, seventh president of the Pennsylvania, who held office from June 9, 1899, to December 28, 1906. He lived to see the work well advanced, although the station was opened under the administration of his successor, James McCrea. The entire project, including the opening of the Hell Gate Bridge route in 1917, providing the through rail connection to points east and north of New York, was brought to consummation under the presidency of Samuel Rea, the company's ninth chief executive. Under the administration of General W. W. Atterbury, the allied project of extending electric operation for both passengers and freight from Pennsylvania Station through Newark, N. J., Philadelphia, Pa., and Baltimore, Md., to Washington, D. C., was planned and the project put into execution.

Some 500 buildings were razed on an eight-acre site in order to build the station itself, and even today, a P. R. R. statement says, it remains the largest structure in the world ever built at one time. Even more outstanding as a technical achievement, this statement adds, was the construction of the two under-river tunnels. The total length of the river tunnels is 6.8 mi. and that of the land tunnels is about the same.

Throughout its quarter of a century of operation, the Pennsylvania Station has been managed by Station Master William H. Egan. He was appointed in August, 1910, having first entered the service of the Pennsylvania as a freight brakeman in June, 1884, and has ever since held this post continuously. To many important visitors he has become one of New York's most familiar figures, and throughout the past 25 years he has had occasion to meet not only prominent Americans from every walk of life, but also dignitaries from abroad.

Santa Fe Accepts Delivery of Diesel

The Atchison, Topeka & Santa Fe has received from the Electro-Motive Corporation the most powerful Diesel locomotive ever placed in service, and if exhaustive tests prove successful will use it to haul the "Chief" between Chicago and California; and on a faster schedule than at present. This 3,600 h.p. locomotive actually is a multiple unit of two identical sections, which can be operated singly or together, or coupled to any desired number of similar units, all of which can be controlled by a single operator. Streamlining has been obtained by modifications in the steel jackets that cover the apparatus; by the molding and slope of the blunt ends; and the flowing steel "skirts," with removable sections, that cover the wheels. Appearance is enhanced by an attractive color scheme done in black, cobalt and sarasota blues, golden olive and pimpernel scarlet. This scheme has been worked out by the Art and Color department of the General Motors Corporation. The Santa Fe emblem of a maltese cross in a circle, combined with the sloping head and streaming headdress of an Indian chief appears on the sides of each unit in full color, taking the place of the usual letters of identification. The name "Super Chief," chosen for the train on which the Diesel is to be used, has been etched on heavy glass panels set into the ends of the locomotive between the forward windows.

Master Boiler Makers' Association to Meet in Chicago

The 1935 business meeting of the Master Boiler Makers' Association, which is to be held at the Hotel Sherman, Chicago, September 18 and 19, will be featured by an address by the newly appointed Chief Inspector, John M. Hall of the Bureau of Locomotive Inspection, Interstate Commerce Commission.

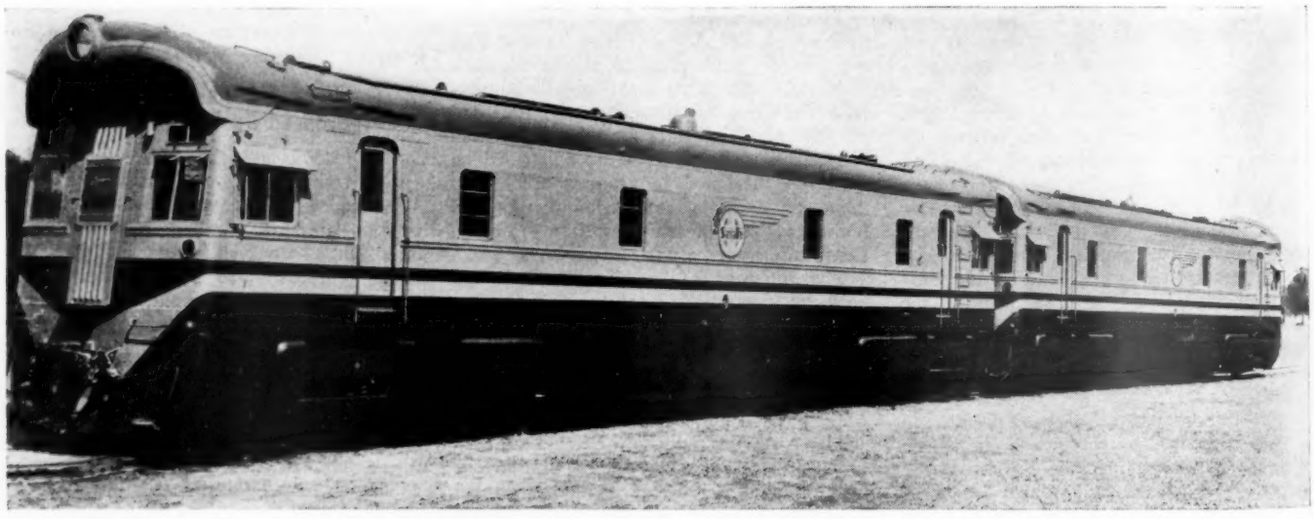
So great have been the developments in locomotive boiler practice during the past five years, in which the activities of this Association have been curtailed, that the forthcoming meeting will provide an opportunity for a large group of the membership to review the materials, tools and methods employed in locomotive boiler maintenance. Authorization has been given by superintendents of motive power generally for their key men from the boiler departments to attend, so a completely representative group of inspectors and supervisors is expected to be present. Committee reports have been prepared for presentation and discussion on the following subjects:

No. 1. "Boiler and Tender Tank Corrosion and Pitting, in Service and in Storage." Committee: J. C. Callahan, general boiler inspector, Chicago Great Western, chairman; Edward J. Reardon, service engineer, Locomotive Firebox Company; A. W. Novak, general boiler inspector, Chicago, Milwaukee, St. Paul & Pacific.

No. 2. "Fusion Welding As Now Applied to Boilers and Tenders." Committee: Ira J. Pool, district boiler inspector, Baltimore & Ohio, chairman; Leonard Ruber, superintendent boiler department, Baldwin Locomotive Works; H. H. Service, general boiler inspector, Atchison, Topeka & Santa Fe.

No. 3. "Staybolt Leakage and Cracking of Firebox Side Sheets—Methods of Prevention." Committee: M. V. Milton, chief boiler inspector, Canadian National, chairman; C. W. Buffington, general master boiler maker, Chesapeake & Ohio; John J. Powers, system boiler maker general, Chicago & North Western.

No. 4. "Application and Maintenance of Arch and, Watertubes with their Maintenance." Committee: William H. Moore, general foreman boiler maker, Pere Marquette, chairman; R. A. Pearson, general boiler inspector, Canadian Pacific; Carl F. Harper, general boiler inspector, Cleveland, Cincinnati, Chicago & St. Louis.



Both of the Two Units Can Be Controlled by a Single Operator

Accelerations by N. Y. C. and P. R. R.

The Twentieth Century Limited of the New York Central and the Broadway Limited of the Pennsylvania will be placed upon a 16½-hour schedule for their runs between New York and Chicago effective September 29, representing a reduction of one half-hour from the present schedule of 17 hours. This is the fourth acceleration of these trains since 1932 when the schedule was reduced from 20 hours to 16 hours.

Other important New York Central trains will have their timing quickened as follows: Commodore Vanderbilt, 15 minutes; Wolverine, 20 minutes; North Shore Limited, 35 minutes westbound; Niagara, one hour eastbound; Southwestern Limited, 10 minutes. The Pennsylvania's Liberty Limited will have a schedule of 17 hr. 25 min. and the timing of the Golden Arrow, the Fort Dearborn and the Pennsylvania Limited will be quickened.

Under the new schedules both the "Century" and the "Broadway" will arrive and depart at the same time: New York departure 5:30 p. m., arriving Chicago 9 a. m.; Chicago departure, 3:30 p. m., arriving New York 9 a. m. The Wolverine will hereafter arrive and depart from La Salle Street Station instead of the Central Terminal. The New York Central will accelerate other services, especially several between New York and Toronto.

Annual Meeting Safety Section

The annual meeting of the Safety Section of the Association of American Railroads and the Steam Railroad Section of the National Safety Council will be held at Louisville, Ky., on October 15, 16 and 17. The program of the meeting is as follows:

Tuesday Morning

Announcements.
Report of secretary, J. C. Caviston.
Report of Committee on Education, L. G. Bentley, general safety agent, Chesapeake & Ohio.
Report of Committee on Trespassing, Robert Scott, director insurance and safety, Atlantic Coast Line.

Tuesday Afternoon

Value of accident prevention, Frank Wenter, general claims agent, Chicago & North Western.
Discussion led by W. H. Failing, claims attorney, Reading.
Report of Committee on Train Accidents, A. A. Lowe, supervisor of transportation, Southern Pacific.
Report of Committee on Nominations.
Report of Committee on Train Service Accidents, C. E. Hill, general safety agent, New York Central.
Discussion:
(a) Struck and run over by locomotives or cars, D. G. Phillips, superintendent of safety, Wabash.
(b) Getting on or off locomotives or cars and operating locomotives, C. L. LaFountaine, general safety supervisor, Great Northern.
(c) Operating hand brakes and coupling cars or locomotives, A. O. Beck, system supervisor, first aid and accident prevention, Canadian National.
Responsibility for Safety.

Wednesday Afternoon

Transportation by rail—Speed with comfort and safety, Roy V. Wright, managing editor, *Railway Age*.
Discussion.
Report of Committee on Prevention of Highway Crossing Accidents, H. A. Rowe, manager claims department, Delaware, Lackawanna & Western.
Discussion.
Round Table.
Election of officers.

Thursday Morning

Report of Committee on Non-Train Accidents, E. B. Perry, assistant to general manager, New York, New Haven & Hartford.
Discussion:
(a) Use of hand tools, H. Cole, assistant to vice-president, Erie.
(b) Collapse and fall of objects, and falls of employees not includable in classes *a* to 1, J. R. Tenney, supervisor of safety, Western Maryland.
(c) Handling rails, ties and bridge timber, S. L. Witman, supervisor of safety, Reading.
Report of Committee on Uniform Practices in Accident Reporting, C. E. Hill, general safety agent, New York Central.
Report of Committee on Resolutions.
Report of tellers.
Installation of officers.

The Roadmasters' Convention

The Roadmasters and Maintenance of Way Association will hold its annual convention at the Hotel Stevens, Chicago, on September 17, 18 and 19. Commemorating the fact that this will be the fiftieth convention of this organization, this meeting is termed the Golden Session and a program will be presented on Tuesday evening reviewing the half century's work of this organization, which is one of the oldest with a record of continuous service in the railway field. Approximately 45 railway supply companies, members of the Track Supply Association, will present exhibits of their materials in connection with the convention. The program for the meeting is as follows:

(All sessions on Chicago Daylight Saving Time —one hour ahead of Central Standard Time.)

Tuesday Morning, September 17

Convention called to order 10 a.m.
Invocation.
Opening address by Harry G. Taylor, chairman, Western Association of Railway Executives, Chicago.
Greetings from the American Railway Engineering Association, by R. H. Ford, president (assistant chief engineer, C.R.I. & P.), Chicago.
Greetings from the American Railway Bridge and Building Association, by T. H. Strate, vice-president (division engineer, C. M. St. P. & P.), Chicago.
Address by President Charles W. Baldridge, assistant engineer, A.T. & S.F., Chicago.
Appointment of special committees.
Report of Committee on Recent Developments in the Organization of Track Forces, W. C. Pruett, chairman; general foreman, M-K-T Lines, Muskogee, Okla.

Tuesday Afternoon
(2:00 p.m.)

Address on The Place of the Railroads in Today's Transportation Picture, by G. S. Fanning, chief engineer, Erie, Cleveland, Ohio.
Report of Committee on The Handling and Distribution of Ties from the Treating Plant or Storage Yard to the Point of Use, E. L. Banion, chairman; roadmaster, A. T. & S. F., Independence, Kan.
Address on Educating Track Men in Efficient Maintenance Methods, by C. J. Geyer, engineer maintenance of way, C. & O., Richmond, Va.
Adjournment to visit exhibit of the Track Supply Association.

Evening Session
(7:30 p.m.)

(Celebrating the Association's 50th Anniversary)
50 Years' Work—A review of the association's activities, by George E. Boyd, associate editor, Railway Engineering and Maintenance, Chicago.
A Half Century's Development in Track Maintenance—an address by B. E. Haley, general roadmaster, A. C. L., Lakeland, Fla.
The Track Supply Manufacturer's Contribution—an address by R. L. Cairncross, western manager, National Lock Washer Company, Chicago.
The Association's Contribution to Railway Efficiency, by John V. Neubert, chief engineer maintenance of way, N. Y. C.

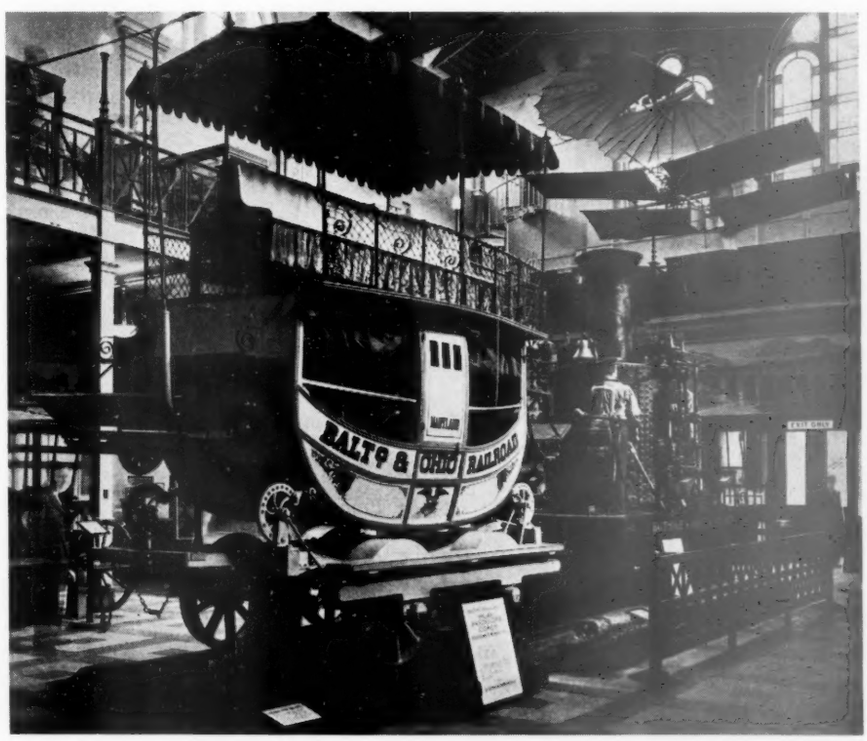
Wednesday Morning, September 18
(9:30 a.m.)

Report of Committee on The Maintenance of Tracks in Terminals—Organization Materials, Methods, A. H. Peterson, chairman; roadmaster, C. M. St. P. & P.
Address on Railway Problems of Today, by S. T. Bledsoe, president, A. T. & S. F. Railway System, Chicago.
Report of Committee on The Maintenance, Reclamation and Repair of Frogs, Switches, Railroad Crossings and Other Track Materials and the Economic Limitation of Such Practices, Walter Constance, chairman; supervisor of reclamation, C. & O., Barboursville, W. Va.

Wednesday Afternoon
(2:00 p.m.)

Address on Looking to the Future in Maintenance, by L. Yager, chief engineer, N. P., St. Paul Minn.
Address, illustrated with moving pictures, on the Movement of Car Wheels at High Speeds, by

* * *



Part of Baltimore & Ohio Exhibit at Smithsonian Institution

Coach and Locomotive on Exhibition at Washington, August 25-December 22—Celebration of the Centenary of the First Train into Washington. (See *Railway Age*, August 31, p. 286.)

H. A. Otis, mechanical engineer, Chicago Rapid Transit Company, Chicago.
Question Box—At which questions submitted by members will be presented for discussion.
Adjournment to visit exhibit of the Track Supply Association.

Wednesday Evening
(6:30 p.m.)

Annual dinner—Guests of Track Supply Association.

Thursday Morning, September 19
(9:30 a.m.)

Report of Committee on Ballasting and Surfacing Track—Equipment, Organization and Methods, John J. Clutz, chairman; supervisor, Penna., Trenton, N. J.
Business session. Election of officers, selection of 1936 convention city, etc.

Thursday Afternoon
(12:50 p.m.)

Leave LaSalle street station on N. Y. C. train for Indiana Harbor, Ind., to visit rail and track fastening mills of the Inland Steel Company.

Equipment and Supplies

LOCOMOTIVES

THE COOS BAY LUMBER COMPANY, Marshfield, Ore., has ordered one locomotive of the 2-8-2 type from the American Locomotive Company. This locomotive will have 20 in. by 24 in. cylinders and a total weight in working order of 205,000 lb.

THE DETROIT, TOLEDO & IRONTON has ordered four freight locomotives of the 2-8-4 type from the Lima Locomotive Works. These locomotives will have 25-in. by 30-in. cylinders and a boiler pressure of 250 lbs.; the tender will have a capacity of 22 tons of coal and 22,000 gals. of water.

FREIGHT CARS

THE SOUTH AFRICAN RAILWAY AND HARBORS ADMINISTRATION is inquiring for 500 four-wheel gondola cars of 20 tons' capacity and 450 eight-wheel gondola cars of 42 tons' capacity. The headquarters of the company are at Johannesburg, South Africa, with London, England, agency at South Africa House, 73, Strand, W.C.2. T. H. Watermeyer is general manager, Johannesburg.

IRON AND STEEL

THE PENNSYLVANIA has given an order to the American Bridge Company for 410 tons of steel for a subway at Newark, N. J.

MISCELLANEOUS

THE FERROCARRIL DEL PACIFICO has given a contract to the Roberts & Schaefer Company, Chicago, for the furnishing of a complete sand-handling plant for installation along this company's lines in Colombia.

THE PENNSYLVANIA has placed an order with The Timken Roller Bearing Company, Canton, Ohio, for bearings and boxes to equip the engine trucks and trailer trucks of eight of its existing class K-4-s (4-6-2 type) passenger locomotives. The installation will be made at the Pennsylvania Altoona shops.

Supply Trade

The Electro-Motive Corporation on September 1 moved its main office and plant from Cleveland, Ohio, to LaGrange, Ill.

S. P. Goodloe, Mutual building, Richmond, Va., has been appointed sales representative of the **Union Spring & Manufacturing Company,** New Kensington, Pa.

John W. Carpenter, for 16 years district sales manager in the Cleveland, Ohio, territory for the Otis Steel Company, has joined the organization of **Republic Steel Corporation,** Youngstown, Ohio, as assistant manager of sales, Sheet and Strip division.

Nelson J. Darling, manager of the River works of the **General Electric Company,** at Lynn, Mass., has assumed management also of the West Lynn works following the retirement of F. P. Cox as manager of those works. Mr. Cox has been associated with the company 45 years.

John F. Raps, central manager, and **C. G. Learned,** eastern manager, of the **Okadee Company** and the **Viloco Railway Equipment Company,** with headquarters at Chicago and New York, respectively, have been appointed vice-presidents, with the same headquarters.

G. M. Hanrahan, for the past ten years with the Haskelite Manufacturing Corporation, has been appointed assistant sales director of the Technical Division of the **Algoma Plywood & Veneer Company,** with main office at 228 North LaSalle street, Chicago. Mr. Hanrahan will have an office at the Detroit Leland Hotel, Detroit, Mich., where he will serve the territory of Ohio, Michigan, New York and Pennsylvania.

OBITUARY

David J. Champion, president of the Champion Rivet Company, Cleveland, Ohio, died suddenly on September 10, at his home in Cleveland.

Nicholas A. Doyle, vice-president of the American Car & Foundry Company at St. Louis, Mo., died after a brief illness in St. Luke's Hospital, Chicago, on September 9, at the age of 68 years. Mr. Doyle started in business as a clerk in the office of the Michigan Car Company, Detroit, Mich., in 1886, and continued with that company and its successor, the Michigan Peninsular Car Company, until the formation of the American Car & Foundry Company in 1899, where he was successively, from October 2, 1900, assistant auditor; from June 28, 1906, auditor; and since November 7, 1917, vice-president, with headquarters at St. Louis.

Construction

CHICAGO, BURLINGTON & QUINCY.—A contract has been awarded to the Roberts & Schaefer Company, Chicago, for the furnishing and erection of a 250-ton steel coaling station serving three tracks at Mendota, Ill. The contract includes the furnishing of complete sanding facilities.

DENVER & SALT LAKE.—A contract has been awarded to Edward Selender, Denver, Colo., for 165,480 cu. yd. of grading, required in connection with 1.8 miles of line revision between Mile Posts 94 and 96. The new line, which will have one one-deg. and two two-deg. curves, will eliminate 13 curves ranging from one to seven degrees, and will reduce the total central angle from 506 deg. 23 min. to 84 deg. 30 min., and effect a reduction in distance of 823 ft.

SOUTHERN.—A United States District Judge at East St. Louis, Ill., has ordered the Southern to pay the cost of constructing and maintaining a reinforced concrete and steel bridge to carry this company's line across the Cahokia Creek channel diversion project of the East Side Levee & Sanitary district at East St. Louis. The railroad had contended that its present bridge across the old channel of the creek is adequate for its needs and that the levee district should pay for the new bridge.

Financial

CHESAPEAKE & OHIO.—*Equipment Trust Certificates.*—The First Boston Corporation and three associated financial houses are offering, subject to the approval of the Interstate Commerce Commission, $9,000,000 of 3 per cent equipment trust of 1935 certificates of this company, maturing in installments from 1936 to 1950, priced to yield from 0.625 per cent to 3.05 per cent.

NEW YORK, CHICAGO & ST. LOUIS.—*Notes.*—This company has announced a plan for meeting the maturity of $15,000,000 of notes due October 1, whereby holders of the notes are asked to deposit them under an agreement to accept new three-year notes in exchange. Holders acceding to the plan would at the time of deposit receive full interest due.

TENNESSEE CENTRAL.—*R. F. C. Loan.*—The Interstate Commerce Commission has authorized the extension for three years of the time of payment of a loan of $147,700 from the Reconstruction Finance Corporation to this company, provided that the first mortgage 6 per cent bonds of the Nashville Terminal be retired or that their maturity date be extended or refinancing arranged.

UNION PACIFIC.—*Seeks to Acquire Line.*—As part of its unification plan, this company has applied to the Interstate Commerce Commission for authority to acquire the properties of the Laramie, North Park

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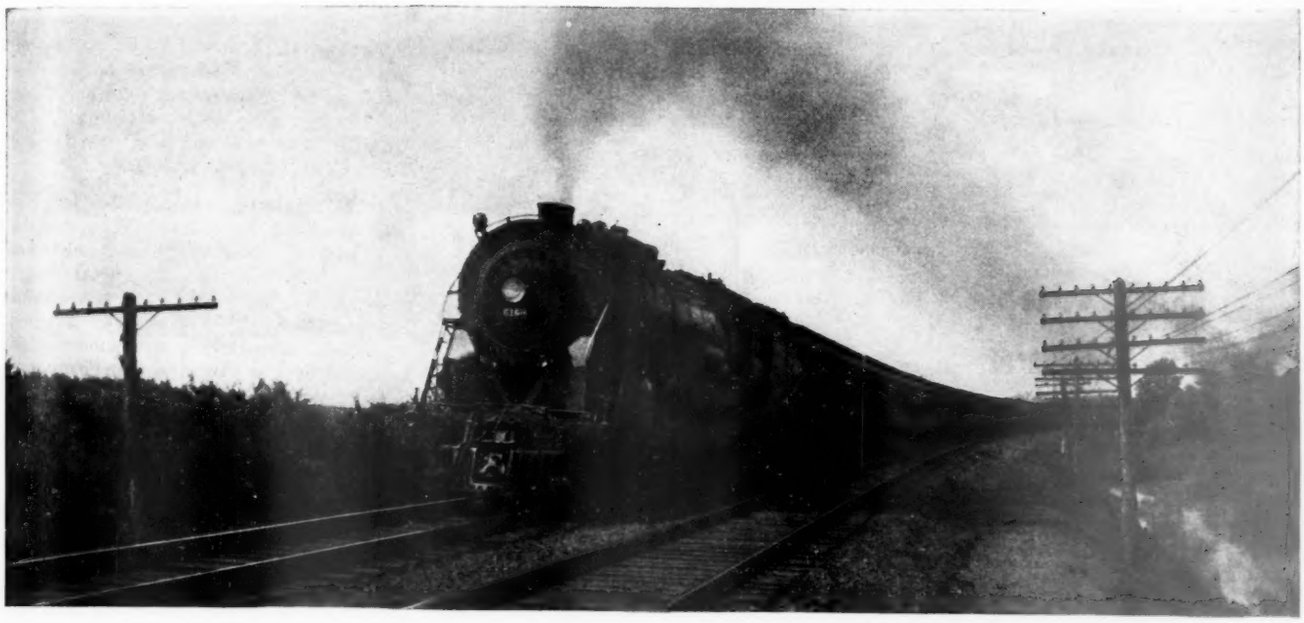
MODERN POWER

INCREASES NET RETURNS!



Net tons per mile of road per day determines the road's earning capacity.

Modern Steam Locomotives are capable of providing an increase of 25% to 30% in ton-mile capacity, compared with locomotives built ten or more years ago.

Modern Power is the key element in railroad net earnings.

LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

& Western, 98 per cent of the stock of which is held by a voting trust. The agreement calls either for a payment of about $650,000 for the 25,000 common shares, less a deduction of $26 a share for each share undelivered, providing that 24,500 shares must be turned over. The preferred stock should be retired.

Average Prices of Stocks and of Bonds

	Sept. 10	Last week	Last year
Average price of 20 representative railway stocks..	37.63	35.89	33.95
Average price of 20 representative railway bonds..	74.42	73.92	71.73

Dividends Declared

Beech Creek.—50¢, quarterly, payable October 1 to holders of record September 16.

Elizabeth & Trenton.—Common, $1.00, semi-annually; Preferred, $1.25, semi-annually, both payable October 1 to holders of record September 20.

Old Colony.—$1.75, quarterly, payable October 1 to holders of record September 14.

St. Joseph, South Bend & Southern.—87½¢; 5 Per Cent Preferred, $2.50, semi-annually, both payable September 16 to holders of record September 10.

Railway Officers

EXECUTIVE

John C. Dice, assistant to vice-president of the Chesapeake & Ohio, with headquarters at Huntington, W. Va., has been appointed assistant vice-president, with the same headquarters. Mr. Dice was born on September 27, 1872, at Hamilton, Va., and was educated in private and high schools and the Randolph-Macon College. He entered the service of the Chesapeake & Ohio in 1915 as special agent, real estate department, reporting to the assistant to

John C. Dice

president. Three years later he was appointed assistant real estate agent reporting to the vice-president and in 1920 he was promoted to special assistant to the vice-president. Mr. Dice was appointed assistant to vice-president in 1922, having charge of public relations literature and activities and supervision of the employees' magazine, holding this position until June, 1928, when he was appointed assistant to vice-president, reporting to the vice-president and general counsel, with continued supervision of public relations activities and other assigned duties.

FINANCIAL, LEGAL AND ACCOUNTING

L. G. Holt, chief clerk to the local treasurer of the Wabash at St. Louis, Mo., has been appointed local treasurer, to succeed **G. E. Francisco,** deceased.

A. T. Summey, senior land appraiser on the Atlantic Coast Line, has been appointed real estate agent, with headquarters at Wilmington, N. C., succeeding **W. G. Forlong,** who has retired.

H. R. German, assistant to president and assistant secretary of the Lehigh Valley, with headquarters at New York, has been elected secretary and treasurer of this

H. R. German

road and subsidiaries, with headquarters at Philadelphia, Pa., and New York. Mr. German entered railway service as a clerk in the coal department of the Delaware, Lackawanna & Western at Utica, N. Y., in April, 1907, and was transferred later that year to New York, where he served as secretary to the vice-president. In February, 1917, he became secretary to the president of the Lehigh Valley and was elected assistant secretary of that road in August, 1918. Mr. German was appointed assistant to president in December, 1929.

Correction

P. J. Kendall, assistant to the general auditor of the Southern Pacific, with headquarters at San Francisco, Cal., has been promoted to auditor of miscellaneous accounts and has been succeeded by **J. A. Quinn,** special accountant and chief clerk. It was erroneously reported in the *Railway Age* of August 24 that Mr. Quinn had been appointed auditor of miscellaneous accounts.

OPERATING

G. C. Jefferis, assistant superintendent of the Middle division of the Atchison, Topeka & Santa Fe, with headquarters at Newton, Kan., has been promoted to superintendent of the Slaton division, with headquarters at Slaton, Tex., to succeed **C. S. Cravens,** who has been transferred to the Middle division, with headquarters at Newton, to succeed **George G. Derby,** deceased.

TRAFFIC

Charles E. Bell, superintendent dining car department of the Seaboard Air Line, with headquarters at Washington, D. C., has been appointed passenger traffic manager, with headquarters at Norfolk, Va.

A. J. Seitz, general freight agent for the Union Pacific, with headquarters at Kansas City, Mo., has been appointed to the newly-created position of general freight and passenger agent at the same point.

Arthur C. Smith has been appointed general agent, passenger department, of the Union Pacific system, with headquarters at Denver, Colo., succeeding **W. K. Cundiff,** who has been granted a leave of absence on account of illness.

J. B. Helwig, general agent for the Minneapolis & St. Louis at Los Angeles, Cal., has been promoted to the newly-created position of assistant general freight agent at the same point, and the position of general agent at Los Angeles has been abolished. Mr. Helwig will supervise solicitation at Los Angeles, San Francisco, Seattle, Wash., and Spokane.

J. P. Heavers, traveling agent for the Minneapolis & St. Louis, with headquarters at Chicago, has been promoted to general agent, with headquarters at Cincinnati, Ohio, to succeed **J. J. McGuinn,** who has been transferred to Chicago. Mr. McGuinn replaces **A. M. McIntyre,** who has been transferred to Minneapolis, Minn., to succeed **J. C. Glenn,** deceased. **Mark P. Adams** has been appointed general agent, traffic department, at Winston-Salem, N. C., to succeed **P. L. Horn,** traffic agent, who has resigned.

MECHANICAL

M. L. Crawford, general foreman on the St. Louis-San Francisco at Ft. Smith, Ark., has been appointed master mechanic of the Central division and Texas Lines, with headquarters at Sherman, Tex., succeeding **W. G. Hall,** who has been transferred to Kansas City, Mo., to succeed **W. B. Berry,** whose appointment as assistant superintendent motive power, with headquarters at Springfield, Mo., was noted in the *Railway Age* of Sept. 7.

OBITUARY

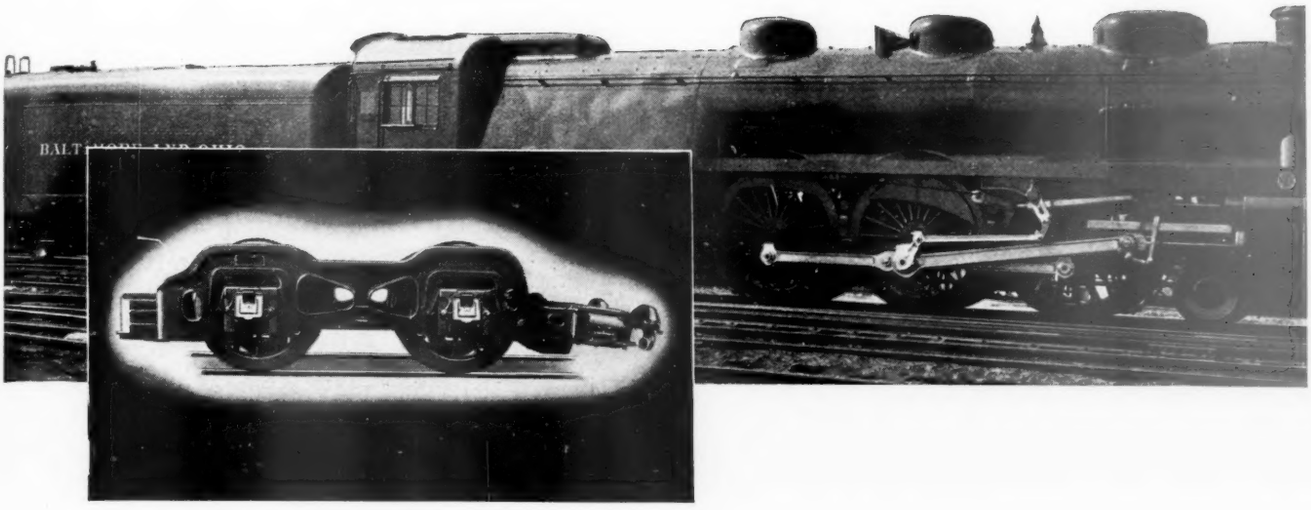
J. D. Tinsley, general agricultural agent for the Panhandle & Santa Fe, with headquarters at Amarillo, Tex., died at that point on August 4.

Donald Schwegel, traveling passenger agent of the Chesapeake & Ohio, died on September 5 at his home in Richmond Hill, Queens, New York. He was 37 years old.

Fred E. Winburn, special representative, Freight Claim division, Association of American Railroads, Chicago, died in that city on September 10 of heart failure while enroute to his office.

Tables of Revenues and Expenses of Railways begin on next left-hand page

AN INTEGRAL PART . . .



. . . OF BALANCED POWER

Idle weight and spare steam are capitalized by The Locomotive Booster. The Booster is a Power Unit—not a specialty.

It is an integral part of any locomotive design that develops maximum capacity with minimum weight.

It provides the extra tractive effort needed for starting, accelerating and tight places, and avoids the need of a lot of excess weight that is used but a small part of the time, but that must be hauled around and maintained all the time.

The modern Booster locomotive is a more efficient and economical locomotive and one that costs far less for maintenance.

No locomotive device is better than the replacement part used for maintenance. Genuine Franklin repair parts assure accuracy of fit and reliability of performance.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1935

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr. & retir. 1935	After depr. & retir. 1934	Before depr. & ret.
Akron, Canton & Youngstown	July	171	$132,814	$40	$140,126	$34,255	$15,848	$7,624	$45,072	$106,083	75.7	$34,043	$27,129	$15,132	$11,162	$20,271
	7 mos.	171	1,057,850	264	1,117,351	155,099	125,215	57,469	364,103	754,309	67.5	363,042	308,003	204,280	212,628	239,240
Alton	July	949	867,999	154,327	1,163,512	325,057	200,887	52,918	479,199	1,113,549	95.7	49,963	—224,417	—197,191	155,301	—169,704
	7 mos.	949	5,521,559	957,124	7,581,399	1,525,344	1,304,442	328,685	3,186,281	6,762,658	89.2	818,741	323,332	—723,348	167,579	—538,154
Atchison, Topeka & Santa Fe System	July	13,260	10,183,107	1,371,095	12,495,141	1,576,287	2,834,209	399,764	4,156,708	9,398,172	75.2	3,096,969	2,281,732	2,316,372	3,154,719	3,252,345
	7 mos.	13,303	59,727,691	7,554,411	74,118,768	9,826,753	18,550,744	2,795,694	27,511,129	60,829,589	82.1	13,289,179	7,266,073	7,044,622	8,352,292	13,686,556
Atlanta & West Point	July	93	102,622	21,436	141,020	19,209	24,523	7,140	57,717	118,211	83.8	22,809	16,312	1,532	—28,294	7,990
	7 mos.	93	597,399	135,087	868,063	131,669	176,949	50,103	373,526	797,780	91.9	70,283	22,270	—58,321	—100,241	—17,705
Western of Alabama	July	133	72,583	21,576	106,550	22,465	29,263	6,642	47,876	114,357	107.3	—7,807	—16,016	—12,537	—20,692	—3,385
	7 mos.	133	514,171	135,739	754,176	154,461	210,937	47,437	332,906	802,374	106.4	—48,198	—105,024	—74,976	—54,239	—16,329
Atlanta, Birmingham & Coast	July	639	276,961	9,878	312,813	43,993	48,255	21,302	108,731	247,618	79.2	65,195	53,068	37,589	14,408	Not shown
	7 mos.	639	1,507,008	50,589	1,760,393	286,212	320,322	150,807	703,448	1,635,725	92.9	124,668	34,839	—71,064	—144,707	Not shown
Atlantic Coast Line	July	5,147	1,911,329	267,878	2,431,221	388,287	694,487	110,420	1,171,889	2,519,349	103.6	—88,128	—288,874	—282,962	—314,818	—95,233
	7 mos.	5,147	17,597,846	3,907,002	24,525,081	2,969,793	4,796,554	840,400	9,590,544	19,397,675	79.1	5,127,406	2,223,083	1,413,165	3,061,216	2,742,919
Charleston & Western Carolina	July	342	144,497	748	148,677	21,040	28,464	6,325	52,613	113,208	76.1	35,469	18,457	18,974	19,867	25,296
	7 mos.	342	1,145,531	9,222	1,186,646	178,549	197,408	43,079	400,004	853,055	71.9	333,491	215,516	210,434	273,863	258,196
Baltimore & Ohio	July	6,439	9,196,523	875,988	10,772,712	1,126,861	2,376,602	381,325	3,939,832	8,507,281	79.0	2,265,431	1,647,245	1,267,784	2,166,003	1,883,670
	7 mos.	6,440	69,003,070	5,582,483	79,768,882	6,513,584	17,441,581	2,602,861	28,741,805	60,081,588	75.3	19,687,294	15,184,236	12,524,382	13,741,861	16,590,796
Staten Island Rapid Transit	July	23	38,646	82,570	130,487	13,117	57,299	2,164	83,400	169,196	129.7	—38,709	—55,959	—37,169	—11,217	7,377
	7 mos.	23	283,091	523,160	861,535	90,137	142,094	13,029	582,058	917,652	106.5	—56,117	—173,625	—321,160	—55,753	—271,382
Bangor & Aroostook	July	603	244,033	10,558	272,412	100,440	87,431	10,725	96,770	319,649	117.3	—47,237	—65,413	—50,646	—74,573	—30,623
	7 mos.	603	3,767,010	179,040	4,099,454	690,907	585,181	41,475	957,713	2,418,575	59.0	1,680,879	1,319,967	1,283,478	1,120,870	1,423,571
Bessemer & Lake Erie	July	225	1,074,459	492	1,082,043	104,085	264,686	11,772	167,264	584,614	54.	497,429	405,885	407,634	320,657	466,904
	7 mos.	225	5,088,669	4,947	5,155,376	663,033	1,181,801	82,201	1,022,908	3,732,842	72.4	1,422,534	1,141,690	1,276,746	820,432	1,687,369
Boston & Maine	July	2,000	2,363,931	580,979	3,432,793	434,293	610,569	67,127	1,425,316	2,726,773	79.4	706,020	496,801	353,726	318,498	486,783
	7 mos.	2,026	17,760,655	3,930,051	25,258,060	3,088,628	4,109,861	438,962	10,412,888	19,346,151	76.6	5,911,909	4,508,969	3,318,740	3,095,600	4,282,025
Brooklyn Eastern District Terminal	July	10.91	78,897	.....	80,834	5,510	10,498	198	25,072	46,187	57.1	34,647	27,828	27,828	27,578	.....
	7 mos.	10.91	563,880	.....	597,423	31,141	66,462	1,603	174,840	310,981	53.6	268,442	220,250	220,810	207,274	.....
Burlington-Rock Island	July	280	50,958	4,373	60,046	16,372	14,605	4,263	44,228	87,836	146.3	—27,790	—34,987	—43,171	—21,702	—40,733
	7 mos.	280	396,713	24,655	456,159	102,469	102,080	29,776	288,348	53,171	126.2	—119,444	—166,560	—229,215	—147,797	—209,845
Cambria & Indiana	July	37	68,237	.....	68,403	8,586	38,746	352	10,146	63,419	92.71	4,984	—10,031	54,523	59,181	Not shown
	7 mos.	37	627,081	.....	628,145	44,959	278,108	2,442	81,747	447,091	71.18	181,054	47,202	524,268	497,349	Not shown
Canadian Pacific Lines in Maine	July	233	74,323	18,357	106,880	30,994	30,577	9,298	46,100	124,111	116.1	—17,231	—23,231	—35,929	—37,418	—33,923
	7 mos.	233	997,795	107,098	1,200,486	243,610	260,529	64,250	461,462	1,078,882	89.8	121,604	79,594	—66,756	31,096	—52,777
Canadian Pacific Lines in Vermont	July	85	53,989	11,370	79,902	15,393	22,023	4,133	51,501	98,445	123.2	—18,543	—23,543	.....	.....	—39,429
	7 mos.	85	395,473	64,230	549,018	89,151	151,056	28,630	387,080	694,835	126.6	—145,817	—180,818	.....	.....	—296,901
Central of Georgia	July	1,926	1,007,807	103,651	1,216,723	160,046	271,172	53,109	500,699	1,040,271	85.5	176,452	103,322	63,583	94,510	133,814
	7 mos.	1,926	6,561,649	722,706	8,271,387	1,084,469	1,815,733	371,995	3,467,971	7,292,181	88.2	979,206	466,634	220,875	273,620	698,274
Central Railroad of New Jersey	July	684	1,745,038	476,586	2,381,845	183,735	459,669	51,930	1,032,911	1,720,382	72.2	661,463	186,618	36,744	—47,363	177,088
	7 mos.	684	13,589,601	2,460,881	17,183,094	1,159,476	3,210,009	321,689	7,217,478	12,547,952	73.0	4,635,142	2,679,990	1,815,503	2,255,195	2,796,831
Central Vermont	July	455	370,408	40,778	456,925	84,869	80,604	15,034	208,455	410,214	89.8	46,711	31,679	15,121	3,983	44,943
	7 mos.	455	2,543,234	242,514	3,086,884	476,122	632,281	95,780	1,440,186	2,772,847	89.8	314,037	200,619	115,100	—34,290	322,152
Chesapeake & Ohio	July	3,110	7,562,384	208,901	8,128,783	854,131	1,650,328	171,020	2,053,994	5,032,696	61.9	3,096,087	2,212,828	2,124,737	2,709,388	2,819,565
	7 mos.	3,112	58,706,247	1,599,112	62,724,859	6,741,029	11,633,468	1,286,422	14,678,613	36,511,496	58.2	26,213,363	20,174,965	19,857,617	21,114,114	24,678,971
Chicago & Eastern Illinois	July	938	697,745	96,123	914,057	153,995	200,718	53,024	428,956	984,171	97.8	19,886	—30,278	—143,635	73,099	—93,212
	7 mos.	938	5,894,685	584,741	7,407,129	954,659	1,325,201	362,170	3,080,977	6,126,406	82.7	1,280,723	879,091	64,633	153,065	420,469
Chicago & Illinois Midland	July	131	257,631	995	267,026	36,413	53,812	15,868	63,770	190,629	71.4	76,397	66,815	63,166	64,477	76,882
	7 mos.	131	1,840,247	7,246	1,894,661	226,287	396,308	114,834	487,867	1,332,365	70.3	562,296	485,801	501,455	398,126	598,078
Chicago & North Western	July	8,428	4,985,773	884,603	6,521,975	1,551,609	1,614,001	177,042	2,564,748	6,217,380	85.3	304,595	—145,977	—465,887	551,863	—36,104
	7 mos.	8,428	32,132,109	5,115,797	41,908,703	6,920,939	9,802,817	1,133,796	17,119,829	37,003,482	88.3	4,905,221	1,556,792	—190,614	1,471,149	2,824,695
Chicago, Burlington & Quincy	July	9,036	5,195,997	726,631	6,639,518	1,295,551	1,219,990	232,811	2,542,022	5,637,139	84.9	1,002,379	729,337	438,671	1,570,050	861,233
	7 mos.	9,036	34,512,232	3,675,509	43,307,272	6,631,686	8,891,106	1,571,493	17,049,360	36,574,163	84.5	6,733,109	3,191,015	1,091,698	5,505,372	4,066,100
Chicago Great Western	July	1,514	1,060,372	46,090	1,193,435	189,168	194,890	54,500	493,324	985,685	82.6	207,750	147,764	—19,001	88,470	23,345
	7 mos.	1,511	7,477,271	286,006	8,382,190	1,267,488	1,389,329	379,220	3,496,250	6,896,475	82.3	1,485,715	1,085,472	—66,520	360,167	237,523
Chicago, Indianapolis & Louisville	July	647	494,227	38,830	604,236	72,490	145,305	27,139	276,476	552,604	91.5	51,632	27,110	—68,894	—26,778	—22,079
	7 mos.	647	3,621,885	298,776	4,461,711	422,768	1,025,162	179,102	1,960,651	3,751,380	84.1	710,331	535,937	—124,630	—298,545	207,151
Chicago, Milwaukee, St. Paul & Pacific	July	11,126	6,052,556	613,944	7,358,503	2,296,662	1,600,440	257,795	2,984,604	7,420,846	100.8	—62,343	—578,748	—1,082,949	314,738	—616,953
	7 mos.	11,132	40,584,213	3,131,326	48,750,839	8,570,924	10,335,489	1,529,225	20,263,797	42,046,383	86.2	6,704,456	2,975,387	20,655	2,903,167	3,311,402
Chicago, Rock Island & Pacific	July	7,574	4,572,351	530,219	5,636,064	806,565	1,196,728	200,733	2,323,382	4,886,604	86.7	749,460	390,395	104,886	44,553	482,579
	7 mos	7,575	28,002,295	3,330,419	35,157,948	4,349,753	7,928,995	1,335,759	16,046,001	32,187,820	91.6	2,970,128	403,070	—1,565,021	561,422	1,062,838

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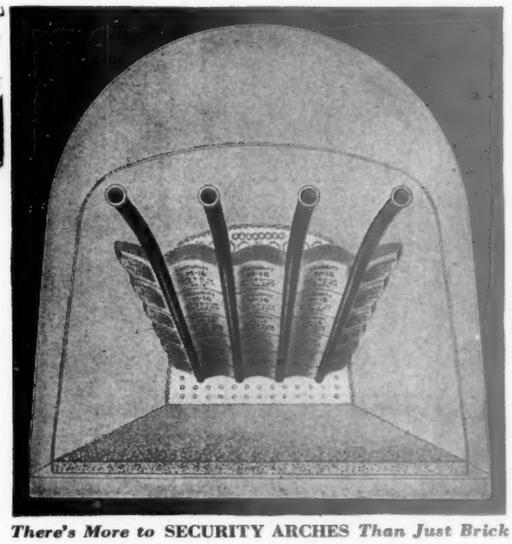

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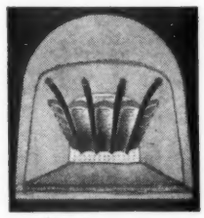

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Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1935—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr. & retir. 1935	After depr. & retir. 1934	Before depr. & ret.
Chicago, Rock Island & Gulf	July	722	$344,862	$25,867	$385,482	$52,458	$30,891	$16,010	$124,840	$248,721	64.5	$136,761	$118,849	$38,747	$81,910	$43,029
	7 mos.	722	1,950,662	161,151	2,198,438	293,613	226,281	112,001	829,254	1,631,831	74.2	566,607	441,554	—39,252	—23,430	—6,999
Chicago, St. Paul, Minn. & Omaha	July	1,651	999,313	142,495	1,245,760	160,000	303,415	39,034	591,549	1,175,793	94.4	69,967	1,088	—101,300	81,497	—48,338
	7 mos.	1,653	6,448,378	878,198	7,973,486	971,213	1,464,280	233,159	4,113,043	7,311,475	91.7	662,011	159,949	—423,889	306,209	—54,855
Clinchfield Railroad	July	309	358,695	4,216	367,341	37,845	104,307	15,458	78,713	249,073	67.8	118,268	80,269	96,036	104,573	139,994
	7 mos.	309	2,895,557	25,797	2,956,700	258,296	760,159	114,380	612,611	1,833,256	62.0	1,123,444	857,436	1,009,352	1,333,682	1,317,582
Colorado & Southern	July	1,019	449,445	39,361	528,248	84,616	100,056	15,421	211,682	445,985	84.4	82,263	26,714	2,944	47,066	36,824
	7 mos.	1,019	2,668,521	169,176	3,149,528	513,740	696,502	89,260	1,347,382	2,884,065	91.6	265,463	—118,477	—221,719	—135,771	118,864
Fort Worth & Denver City	July	804	365,387	43,043	462,121	53,690	77,806	17,534	152,109	337,069	72.9	125,052	97,135	66,406	369,226	87,536
	7 mos.	804	2,155,965	226,418	2,784,747	314,332	528,002	115,734	1,077,575	2,278,601	81.8	506,146	305,407	113,949	993,639	265,122
Columbus & Greenville	July	167	58,953	6,212	71,254	18,271	11,252	3,578	29,868	72,419	101.6	—1,165	—3,556	—1,254	—2,047	1,543
	7 mos.	167	407,500	39,190	484,341	114,858	86,012	26,283	216,396	509,604	105.2	—25,263	—44,393	—29,958	—9,243	—10,227
Delaware & Hudson	July	835	1,478,121	107,186	1,678,920	306,793	549,577	50,469	700,018	1,739,110	103.6	—60,190	—173,745	—152,689	—75,646	—54,226
	7 mos.	835	12,356,060	579,048	13,539,619	1,910,025	3,640,961	339,535	5,244,004	11,910,886	88.0	1,628,733	988,998	1,085,162	1,293,930	1,686,487
Delaware, Lackawanna & Western	July	992	2,222,625	558,934	3,183,619	698,558	708,597	124,326	1,608,818	3,325,027	104.4	—141,408	—457,316	—517,335	29,980	—290,438
	7 mos.	992	19,290,504	3,711,167	25,995,270	2,680,398	5,056,309	815,691	11,973,175	21,799,520	83.9	4,195,750	1,913,751	1,800,237	3,003,252	3,387,685
Denver & Rio Grande Western	July	2,584	1,332,338	188,276	1,622,702	300,268	457,027	52,535	557,712	1,457,162	89.8	165,540	15,315	—36,314	133,389	63,733
	7 mos.	2,598	9,031,608	696,446	10,402,287	1,372,932	2,874,447	353,754	3,664,838	8,863,002	85.2	1,539,285	473,124	196,954	965,493	893,433
Denver & Salt Lake	July	232	89,979	4,134	102,221	27,264	34,456	2,345	31,121	96,779	94.7	5,442	—10,558	34,877	52,553	39,283
	7 mos.	232	831,441	27,020	919,732	125,968	219,611	12,690	233,026	617,965	67.2	301,767	199,762	505,371	174,558	542,843
Detroit & Mackinac	July	242	43,572	2,852	53,119	11,686	11,825	943	21,932	48,379	91.1	4,740	2,241	1,376	20,970	4,816
	7 mos.	242	266,769	17,828	325,012	74,600	64,376	6,167	146,808	315,840	97.2	9,172	2,624	—11,123	49,350	13,182
Detroit & Toledo Shore Line	July	50	215,244	.....	216,643	25,512	24,781	8,977	54,881	121,308	56.0	95,335	77,283	42,030	23,910	46,837
	7 mos.	50	2,037,912	.....	2,052,677	168,137	181,802	51,381	500,917	939,765	45.8	1,112,912	933,992	586,327	529,900	631,657
Detroit, Toledo & Ironton	July	472	457,167	210	467,368	53,420	68,691	10,166	107,727	250,037	53.5	217,331	185,199	165,070	95,119	186,347
	7 mos.	472	5,006,077	1,802	5,185,295	483,421	631,472	74,151	1,002,829	2,328,216	44.9	2,857,079	2,437,059	2,081,857	1,413,862	2,231,280
Duluth, Missabe & Northern	July	560	1,616,760	3,015	1,864,356	135,273	197,232	3,807	283,672	667,748	35.8	1,196,608	1,064,675	1,065,841	1,023,857	1,113,225
	7 mos.	560	5,240,276	22,036	6,035,654	848,379	1,203,888	23,770	1,352,905	3,656,588	60.6	2,379,066	1,805,299	1,807,237	611,052	2,080,365
Duluth, Winnipeg & Pacific	July	178	74,649	2,714	80,140	33,706	22,420	1,819	37,095	100,013	124.8	—19,873	—23,803	—34,127	—15,556	—31,027
	7 mos.	178	540,391	14,940	573,904	163,670	114,878	12,156	272,731	587,305	102.3	—13,401	—42,645	—105,021	—16,828	—81,718
Elgin, Joliet & Eastern	July	434	833,228	5	979,084	133,758	235,261	13,738	399,815	827,779	84.5	151,305	71,271	87,240	—123,466	161,873
	7 mos.	444	7,008,698	10	7,907,423	770,822	1,737,016	93,553	2,913,750	5,721,380	72.4	2,186,043	1,570,670	1,504,223	576,194	2,027,521
Erie	July	2,304	4,932,232	449,951	5,816,891	770,188	1,194,463	176,966	2,365,906	4,740,685	81.5	1,076,206	740,421	460,897	954,090	796,670
	7 mos.	2,304	35,896,208	2,826,991	42,156,834	3,906,246	8,469,872	1,160,410	16,069,110	31,638,970	75.1	10,517,864	8,165,414	6,445,233	8,433,404	8,856,006
New Jersey & New York	July	45	14,585	45,986	62,189	8,080	21,751	811	47,386	80,012	128.7	—17,823	—21,973	—35,189	—35,821	—31,734
	7 mos.	45	108,742	337,826	460,019	42,806	164,532	7,703	340,010	575,569	125.1	—115,550	—144,609	—254,041	—242,629	—232,023
New York, Susquehanna & Western	July	215	260,317	26,064	300,451	30,709	53,927	5,215	114,927	217,431	72.4	83,020	60,469	39,851	15,840	55,911
	7 mos.	215	1,899,472	175,544	2,191,589	180,053	380,056	33,834	876,020	1,558,996	71.1	632,593	474,437	254,357	324,743	348,171
Florida East Coast	July	811	214,754	66,982	307,146	117,740	124,443	16,244	160,884	469,410	152,8	—162,264	—201,090	—196,260	—252,427	—157,671
	7 mos.	811	3,143,649	1,481,121	5,297,063	863,020	970,589	148,150	1,774,018	4,137,890	78.1	1,159,173	674,826	344,175	745,400	676,576
Fort Smith & Western	July	249	41,837	1,095	45,933	14,428	8,791	5,093	18,627	50,938	110.9	—5,005	—6,505	—11,882	—6,490	—11,213
	7 mos.	249	321,311	6,109	350,018	99,921	62,869	37,142	131,046	359,735	102.8	—9,717	—21,181	—57,813	—31,314	—54,832
Georgia Railroad	July	329	232,673	14,260	266,229	28,509	55,202	17,009	119,987	232,627	87,4	33,602	28,908	31,045	46,443	45,596
	7 mos.	329	1,568,665	87,755	1,816,992	183,350	359,081	117,724	804,198	1,548,130	85.2	268,862	236,409	295,755	261,966	383,447
Georgia & Florida	July	408	71,039	3,050	77,445	24,585	17,516	7,802	31,066	80,373	103.8	—2,928	—7,590	—11,801	—21,997	—6,506
	7 mos.	408	558,368	14,661	600,042	146,120	111,308	54,538	230,118	580,311	96.7	19,731	—12,472	—23,619	—41,109	12,981
Grand Trunk Western	July	1,006	1,527,282	74,412	1,716,720	301,834	346,714	34,261	691,119	1,453,677	84.7	263,043	187,879	96,435	32,313	186,155
	7 mos.	1,006	10,645,978	432,687	11,906,480	1,559,742	2,457,276	227,367	4,878,698	9,613,636	80.7	2,292,844	1,761,985	927,996	718,693	1,555,032
Canadian Nat'l Lines in New Eng.	July	172	85,292	11,327	105,389	27,909	25,412	2,684	58,891	124,763	118.4	—19,374	—30,671	—66,194	—72,797	—60,678
	7 mos.	172	531,390	41,575	627,210	175,080	157,600	17,620	408,586	818,186	130.4	—190,976	—270,071	—526,802	—469,402	—490,141
Great Northern	July	8,262	5,963,056	459,074	7,059,171	921,692	1,082,167	178,770	2,084,107	4,559,133	64.6	2,500,038	1,872,651	1,771,402	1,244,967	2,057,626
	7 mos.	8,294	33,169,530	2,448,238	39,154,217	3,528,578	7,048,670	1,209,854	13,805,285	26,871,845	68.6	12,282,372	8,327,783	7,559,650	4,420,688	9,547,151
Green Bay & Western	July	234	105,682	1,013	112,390	29,105	22,623	5,377	39,063	94,421	84.0	17,969	10,452	7,577	—13,024	11,916
	7 mos.	234	763,231	7,068	801,770	165,801	115,821	36,862	300,549	639,715	79.7	162,055	113,937	81,970	—34,752	110,364
Gulf & Ship Island	July	259	77,309	12,026	99,828	15,079	14,792	2,924	53,095	90,137	90.3	9,691	—4,660	—13,916	—26,373	—9,486
	7 mos.	259	566,801	59,394	742,478	103,613	119,674	20,859	363,706	643,910	86.7	98,568	—2,339	—64,179	—72,540	—35,657
Gulf, Mobile & Northern	July	936	455,229	28,970	504,169	61,018	76,586	38,645	148,297	344,995	68.43	159,174	129,169	82,993	8,773	99,819
	7 mos.	936	3,027,524	137,285	3,308,834	415,958	510,364	231,258	1,011,178	2,291,841	69.26	1,016,993	806,348	487,179	316,262	608,024
Illinois Central	July	4,980	5,402,869	594,205	6,458,252	771,849	1,681,559	198,644	2,561,820	5,587,837	86.5	870,415	434,037	243,116	868,700	816,771
	7 mos.	4,980	38,976,621	4,516,783	47,775,115	4,482,886	11,366,999	1,405,915	18,636,826	38,518,496	80.6	9,256,619	6,107,601	5,389,767	7,059,636	9,422,505

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His Mind Is Relieved

Underwood & Underwood

To standardize on Elesco unit REmanufacturing service is to relieve the minds of the operating and mechanical officials of thoughts of exasperating failures of worn or patched superheater units.

RAILROAD officials have many complex problems daily. Why not relieve their minds of possibilities of superheater troubles? Particularly when this can be done so easily and at nominal cost by having unserviceable superheater units REmanufactured with assurance of full efficiency and freedom from service failures.

Analysis of shop costs shows that, with the exception of the dry pipe, the superheater is ordinarily the least expensive part of the locomotive to maintain. But, when superheater units become unserviceable, to tamper with their proportions through shortening, butt-welding on return bends and ball-end sections is a sure way to lowered efficiency and the liability of failure in service. You cannot depend on repair work for superheater units.

When you have unserviceable units REmanufactured, they are restored to a condition practically equal to that of new units. REmanufactured units give the same highly efficient, reliable duty for many years. We REmanufacture them and return them while the engine is being shopped.

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, Inc.

60 East 42nd Street
NEW YORK

ELESCO

Peoples Gas Building
CHICAGO

A-1007 Canada: The Superheater Company, Limited, Montreal

Superheaters - Feed Water Heaters - Exhaust Steam Injectors - Superheater Pyrometers - American Throttles

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1935—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr.& retir. 1935	After depr.& retir. 1934	Before depr.& ret.
Yazoo & Mississippi Valley	July	1,635	$783,774	$70,906	$912,172	$109,855	$183,658	$30,055	$399,706	$775,290	85.0	$136,882	$19,454	—$61,447	—$65,260	—$13,278
	7 mos.	1,635	5,557,359	425,559	6,479,068	610,949	1,242,827	210,519	2,830,943	5,253,885	81.1	1,225,183	405,384	—100,777	192,702	210,737
Illinois Central System	July	6,616	6,186,643	665,111	7,370,424	881,704	1,865,217	228,699	2,961,526	6,363,127	86.3	1,007,297	447,736	186,669	813,618	808,493
	7 mos.	6,616	44,533,980	4,942,342	54,254,183	5,093,835	12,609,826	1,616,434	21,467,769	43,772,381	80.7	10,481,802	6,487,640	5,338,065	7,321,095	9,682,317
Illinois Terminal	July	525	328,155	56,572	422,540	58,585	63,361	16,955	145,505	301,530	71.36	121,010	93,120	78,686	66,583	99,258
	7 mos.	525	2,233,300	414,866	2,898,091	314,372	455,080	111,683	1,064,128	2,034,850	70.21	863,241	679,409	573,662	540,778	719,724
Kansas City Southern	July	878	694,458	21,864	811,706	83,724	141,198	46,619	258,292	586,698	72.3	225,008	158,193	125,464	95,993	154,774
	7 mos.	878	4,654,306	128,181	5,443,100	553,925	967,992	335,754	1,826,817	4,174,185	76.7	1,268,915	812,535	558,278	777,614	772,272
Kansas, Oklahoma & Gulf	July	326	170,299	455	173,736	36,187	10,504	7,625	38,820	97,729	56.3	76,007	62,417	44,362	53,753	46,251
	7 mos.	326	1,077,988	2,742	1,099,309	155,230	121,883	52,140	272,803	638,748	58.1	460,561	377,763	264,404	344,593	277,689
Lake Superior & Lake Ishpeming	July	160	268,100	98	309,529	29,845	22,458	983	41,480	100,900	32.6	208,629	169,083	167,343	87,664	174,438
	7 mos.	160	796,258	705	901,959	172,066	172,648	4,686	194,366	576,182	63.9	325,777	198,475	187,090	107,639	223,081
Lehigh & Hudson River	July	96	110,825	172	112,443	15,220	13,481	3,238	40,565	79,367	70.6	33,076	24,176	10,941	5,180	15,062
	7 mos.	96	870,929	1,098	883,889	92,176	138,796	22,412	305,697	602,449	68.2	281,440	201,794	111,701	96,376	140,931
Lehigh & New England	July	219	260,225	338	262,735	38,822	60,949	5,391	99,244	219,714	83.6	43,021	36,476	50,739	47,657	69,513
	7 mos.	220	2,031,025	1,976	2,047,780	222,676	410,629	38,609	732,499	1,486,434	72.6	561,346	513,716	569,346	481,663	702,993
Lehigh Valley	July	1,354	2,592,394	186,542	2,997,594	546,923	548,603	114,603	1,479,538	2,874,417	95.9	123,177	—75,370	—230,007	27,834	—23,854
	7 mos.	1,354	20,794,565	1,320,770	23,764,842	1,913,983	4,173,634	778,787	10,646,789	18,602,413	78.3	5,162,429	3,828,964	2,883,308	3,319,381	4,294,887
Louisiana & Arkansas	July	608	384,669	9,951	421,485	56,325	61,462	26,980	101,855	256,393	60.8	165,092	126,028	113,285	76,405	127,485
	7 mos.	608	2,391,896	60,377	2,630,933	345,063	447,061	175,537	676,369	1,754,298	66.7	876,635	636,360	570,060	546,927	670,576
Louisiana, Arkansas & Texas	July	255	85,169	280	87,920	19,253	7,802	4,390	27,792	63,688	72.4	24,232	21,732	7,677	—4,437	8,416
	7 mos.	255	533,735	1,525	550,986	136,947	57,044	32,123	187,655	437,558	79.4	113,428	97,253	13,766	9,189	19,141
Louisville & Nashville	July	5,047	4,772,662	484,552	5,711,067	629,534	1,195,062	169,575	2,141,181	4,440,770	77.8	1,270,297	938,691	953,813	524,492	1,300,991
	7 mos.	5,049	35,268,746	3,232,239	42,044,899	4,647,386	9,172,604	1,201,794	15,403,557	32,577,327	77.5	9,467,572	7,139,626	7,219,471	7,477,593	9,713,477
Maine Central	July	1,066	685,356	96,414	875,388	123,526	166,859	13,571	325,639	666,137	76.1	209,251	160,106	138,382	118,477	184,419
	7 mos.	1,054	5,502,396	566,246	6,685,607	1,009,156	1,115,125	79,766	2,545,205	5,015,529	75.0	1,670,078	1,328,105	953,132	749,997	1,274,205
Midland Valley	July	361	116,046	12	118,066	16,370	9,835	2,393	28,251	61,626	52.2	56,440	48,871	43,223	33,937	45,071
	7 mos.	361	678,377	61	692,343	100,475	82,190	16,771	192,190	424,742	61.3	267,601	217,413	168,226	167,939	181,245
Minneapolis & St. Louis	July	1,625	501,805	14,753	551,875	96,990	123,017	32,982	274,818	564,526	102.3	—12,651	—35,917	—69,540	—39,356	—36,458
	7 mos.	1,644	3,537,368	91,307	3,891,239	507,698	855,450	203,004	2,030,978	3,861,220	99.2	30,019	—129,160	—316,207	—258,645	—77,287
Minn., St. Paul & S. S. Marie	July	4,297	1,828,634	133,618	2,148,999	328,592	376,883	64,879	814,761	1,704,374	79.3	444,625	318,882	171,743	40,912	277,646
	7 mos.	4,297	10,827,029	616,741	12,501,342	1,899,334	2,580,036	410,804	5,623,922	11,115,304	88.9	1,386,038	523,074	—325,209	—40,988	327,258
Duluth, South Shore & Atlantic	July	556	201,738	11,801	236,383	33,967	35,964	4,640	77,377	157,654	66.7	78,729	74,980	67,568	56,113	75,474
	7 mos.	556	1,130,904	70,084	1,320,884	184,836	243,376	30,482	531,720	1,011,490	76.6	309,394	269,119	212,025	106,584	268,621
Spokane International	July	163	53,237	1,688	59,873	17,258	5,120	1,884	21,006	49,099	82.0	10,774	7,842	4,585	—7,875	5,694
	7 mos.	163	254,153	12,332	303,362	81,149	39,463	12,586	137,499	293,713	96.8	9,649	—10,791	—29,125	—42,061	—21,473
Mississippi Central	July	150	52,611	2,020	56,869	9,490	11,060	6,819	17,545	50,628	89.0	6,241	3,421	1,562	—7,201	4,298
	7 mos.	150	368,874	10,897	394,640	54,136	75,278	48,153	125,193	338,948	85.9	55,692	35,594	12,193	—4,416	32,093
Missouri-Arkansas	July	364	66,738	1,683	74,228	14,581	6,726	3,494	23,812	52,648	70.9	21,580	20,476	12,161	.....	12,665
	7 mos.	364	233,525	4,190	258,738	53,485	22,926	13,248	85,971	190,412	73.6	68,326	63,806	37,507	.....	39,232
Missouri Illinois	July	208	82,220	791	84,873	24,978	13,073	2,688	27,977	72,578	85.5	12,295	7,095	—1,615	—5,520	1,711
	7 mos.	208	579,016	5,001	596,047	146,410	82,301	19,262	197,984	474,599	79.6	121,448	92,437	34,538	44,284	57,849
Missouri-Kansas-Texas Lines	July	3,293	1,989,529	156,190	2,365,131	365,396	463,485	110,581	822,979	1,902,007	80.4	463,124	314,924	98,185	297,737	204,963
	7 mos.	3,293	11,750,850	1,055,315	14,457,156	2,289,909	2,872,156	768,464	5,669,167	12,450,380	86.1	2,006,776	853,232	—476,977	1,106,002	281,556
Missouri Pacific	July	7,230	5,313,767	397,466	6,254,013	1,034,934	1,307,660	228,653	2,320,745	5,213,309	83.4	1,040,704	723,260	331,613	648,935	693,869
	7 mos.	7,234	34,586,182	2,300,175	40,890,429	6,171,613	9,053,423	1,578,661	15,938,986	34,268,853	83.8	6,621,576	4,396,805	1,824,258	4,540,905	4,372,454
Gulf Coast Lines	July	1,763	626,653	33,986	715,592	135,925	163,197	44,779	297,796	690,593	96.51	24,999	29,904	70,281	15,592	.....
	7 mos.	1,763	5,238,267	218,577	5,894,392	915,733	1,109,244	297,784	2,013,043	4,582,632	77.75	1,311,760	953,652	360,212	839,728	.....
International-Great Northern	July	1,154	777,813	76,076	966,144	139,742	186,832	30,772	385,142	804,007	83.22	162,137	129,588	42,284	120,555	74,853
	7 mos.	1,154	5,424,304	429,737	6,663,596	981,476	1,272,748	202,108	2,701,263	5,458,399	81.91	1,205,197	962,079	321,300	930,143	545,739
Mobile & Ohio	July	1,201	672,604	36,979	755,581	102,619	169,559	38,772	292,170	623,395	82.5	132,186	99,981	45,094	—10,844	96,392
	7 mos.	1,201	4,333,407	172,460	4,837,944	741,083	1,045,329	274,256	2,001,395	4,332,918	89.6	505,026	277,147	—134,094	36,544	283,279
Monongahela	July	174	262,824	597	264,907	34,282	26,360	415	55,418	119,208	45.0	145,699	128,649	52,469	64,565	58,357
	7 mos.	174	2,284,566	5,527	2,304,481	202,979	191,824	3,135	485,280	910,001	39.5	1,394,480	1,269,887	686,506	708,147	728,040
Montour	July	57	157,417	.....	158,256	27,930	32,299	920	33,565	100,952	63.8	57,304	43,024	63,452	79,914	72,533
	7 mos.	57	1,072,816	.....	1,078,648	99,330	230,794	6,349	245,717	629,861	58.4	488,787	348,004	474,232	404,389	537,130

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ALCO

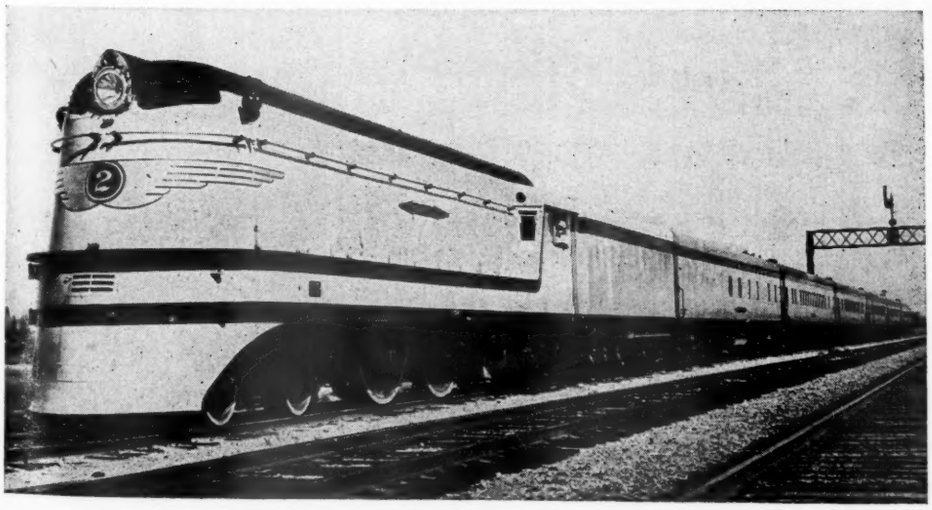
HORSEPOWER

The steam locomotive is a direct connected machine. As the speed of the steam locomotive increases, its horsepower increases until it reaches its cruising speed. Here, within a considerable range, it can develop its full horsepower output. (In the case of the "Hiawatha" about 3,000 sustained horsepower.)

In fast schedules — requiring top speeds up to 80 and 100 miles an hour — stops and starts will be few, but slow-downs to 40 and 50 miles an hour may be numerous.

Here is a situation admirably suited to the steam locomotive. In this speed range the steam locomotive has the horsepower needed for quick speed restoration.

AMERICAN LOCOMOTIVE COMPANY



30 CHURCH STREET · NEW YORK · N.Y.

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1935—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr.& retir. 1935	After depr.& retir. 1934	Before depr.& ret.
Nashville, Chattanooga & St. Louis	July	1,184	$870,074	$81,245	$1,037,702	$140,692	$234,277	$57,678	$423,248	$918,309	88.5	$119,393	$80,550	$71,506	$39,947	$116,231
	7 mos.	1,187	5,850,697	539,394	7,210,878	961,615	1,766,546	411,034	2,969,704	6,539,397	90.7	671,481	422,403	253,470	747,750	560,899
Nevada Northern	July	165	23,214	368	27,302	8,795	2,980	706	7,195	21,912	80.3	5,390	—1,256	2,626	9,675	.....
	7 mos.	165	167,377	5,145	203,892	61,840	22,080	5,135	53,959	167,597	82.2	36,295	—9,083	17,376	22,065	.....
New York Central	July	11,364	16,581,808	4,527,929	23,822,499	2,879,125	5,051,222	569,931	9,451,598	19,296,827	81.0	4,525,672	3,124,155	1,798,405	1,825,457	3,188,371
	7 mos.	11,364	122,695,794	31,124,856	174,347,821	16,853,445	37,426,433	3,723,211	66,819,966	134,371,391	77.1	39,976,430	26,536,237	17,459,263	18,993,139	27,171,727
Pittsburgh & Lake Erie	July	233	1,363,688	39,896	1,439,337	135,145	375,330	26,956	465,884	1,081,447	75.1	357,890	243,215	389,558	289,461	539,884
	7 mos.	233	8,620,443	306,616	9,221,407	727,851	2,784,373	185,525	3,185,554	7,417,762	80.4	1,803,645	1,080,680	2,099,974	2,209,950	3,159,714
New York, Chicago & St. Louis	July	1,691	2,341,282	80,634	2,523,041	351,803	431,255	107,138	928,847	1,946,571	77.2	576,470	476,068	208,500	239,774	343,245
	7 mos.	1,691	17,978,664	434,110	19,092,750	2,028,777	2,898,600	737,038	6,760,825	13,294,898	69.6	5,797,852	4,980,696	3,232,371	3,612,221	4,192,701
N. Y., New Haven & Hartford	July	2,073	3,285,911	1,801,042	5,674,964	621,461	989,147	111,351	2,241,535	4,219,601	74.4	1,455,363	1,181,088	636,670	168,362	924,108
	7 mos.	2,069	23,444,138	12,497,783	40,557,899	4,344,793	6,679,540	598,102	15,958,834	29,870,458	73.6	10,687,441	8,512,169	4,880,499	3,872,636	6,898,180
New York Connecting	July	20	185,663	.....	191,554	14,745	7,964	.....	31,553	55,283	28.9	136,271	102,341	64,915	74,733	64,915
	7 mos.	20	1,515,752	.....	1,590,795	87,146	48,889	.....	236,916	379,787	23.9	1,211,008	972,738	736,142	781,485	736,142
New York, Ontario & Western	July	567	559,029	132,655	743,842	100,881	143,857	10,961	300,431	580,247	78.0	163,595	126,577	92,595	165,926	.....
	7 mos.	567	4,514,873	207,781	5,087,835	492,726	891,212	82,715	2,139,607	3,790,415	74.5	1,297,420	1,034,546	769,462	830,781	.....
Norfolk & Western	July	2,166	5,531,299	165,664	5,904,088	658,747	1,157,868	127,747	1,427,134	3,498,452	59.3	2,405,636	1,692,315	1,902,001	1,488,258	2,244,425
	7 mos.	2,169	39,914,724	982,411	42,373,346	4,784,011	8,691,977	842,546	10,285,120	26,052,632	61.5	16,320,714	11,477,894	12,728,379	13,083,468	15,133,465
Norfolk Southern	July	932	344,178	14,935	375,378	68,706	52,518	22,508	147,247	313,692	83.6	61,686	35,912	9,382	55,617	18,962
	7 mos.	932	2,606,976	66,591	2,806,486	511,485	367,770	151,940	1,037,071	2,184,125	77.8	622,361	439,073	243,673	415,732	308,933
Northern Pacific	July	6,722	3,434,916	376,372	4,232,207	613,673	1,076,006	162,664	1,700,866	3,836,541	90.7	395,666	—62,023	191,887	672,835	.....
	7 mos.	6,722	22,349,357	1,937,058	27,027,320	3,789,558	7,044,356	1,123,360	11,510,262	25,695,477	95.1	1,331,843	—1,801,622	217,392	2,774,998	.....
Northwestern Pacific	July	375	184,016	100,823	329,305	37,608	53,107	4,211	167,277	275,880	83.8	53,425	38,199	28,066	99,278	43,100
	7 mos.	375	1,001,372	523,972	1,769,229	263,508	352,277	27,607	1,037,998	1,778,222	100.5	—8,993	—116,043	—176,465	15,286	—73,970
Oklahoma City-Ada-Atoka	July	132	34,397	385	36,499	6,769	3,264	818	10,973	23,885	65.4	12,614	10,306	2,968	—4,972	2,976
	7 mos.	132	240,533	2,307	258,419	56,805	11,329	5,484	76,206	160,314	62.0	98,105	86,147	35,418	347	35,478
Pennsylvania Railroad	July	10,481	22,183,182	4,513,540	29,508,837	2,848,578	5,192,516	606,511	10,815,489	21,217,112	71.9	8,291,725	5,837,917	4,904,938	4,617,898	6,691,278
	7 mos.	10,481	153,852,361	34,351,698	208,362,786	18,067,833	39,498,547	4,185,996	76,273,930	150,429,519	72.2	57,933,267	42,838,298	37,560,956	37,401,038	49,634,429
Long Island	July	396	412,071	1,813,702	2,310,580	108,004	350,181	22,936	963,657	1,502,211	65.0	808,369	436,832	269,208	351,455	361,769
	7 mos.	396	3,433,090	9,779,150	13,837,683	1,220,368	2,448,606	108,313	6,586,452	10,766,528	77.8	3,071,155	1,555,227	368,468	1,144,438	1,005,984
Pennsylvania-Reading Seashore Lines	July	413	208,769	556,672	795,296	44,544	93,916	12,384	362,041	542,584	68.2	252,712	131,128	—2,441	—45,342	12,221
	7 mos.	413	1,566,787	1,452,583	3,175,628	409,402	611,719	56,762	1,993,813	3,265,072	102.8	—89,444	—646,009	—1,196,407	—1,242,899	—1,114,787
Pere Marquette	July	2,129	1,801,311	88,197	2,022,704	261,243	500,453	68,384	785,484	1,711,517	84.6	311,187	221,182	145,710	160,510	361,149
	7 mos.	2,129	14,289,104	401,979	15,486,106	1,697,572	3,460,770	436,537	5,807,732	12,065,219	77.9	3,420,887	2,756,926	2,061,751	2,285,290	3,567,169
Pittsburg & Shawmut	July	101	28,202	143	29,054	9,446	11,758	1,571	12,203	36,725	126.4	—7,671	—8,076	—2,827	11,205	3,819
	7 mos.	101	388,109	2,731	396,245	74,001	125,126	9,829	130,151	358,368	90.4	37,877	34,802	53,381	87,248	104,780
Pittsburgh & West Virginia	July	138	193,381	.....	210,248	30,048	52,952	13,778	46,062	172,062	81.8	38,186	21,140	34,688	28,288	57,205
	7 mos.	138	1,557,474	.....	1,643,673	171,507	390,449	92,565	352,015	1,154,802	70.3	488,871	365,725	516,544	535,235	688,726
Pittsburg, Shawmut & Northern	July	190	55,067	42	56,426	21,548	16,013	1,486	25,352	70,916	125.7	—14,490	—16,499	—19,179	—29,745	—16,432
	7 mos.	190	572,860	944	584,212	120,666	121,790	9,746	223,499	520,553	89.1	63,659	48,236	7,512	—19,725	26,549
Reading	July	1,459	3,277,110	222,071	3,691,937	350,978	712,923	75,833	1,575,267	2,883,860	78.1	808,077	563,063	657,174	661,269	933,541
	7 mos.	1,459	27,083,990	1,712,756	30,357,015	2,333,772	5,413,697	531,258	11,764,396	21,575,363	71.1	8,781,652	6,578,583	6,808,392	8,035,967	8,582,646
Richmond, Fredericksburg & Potomac	July	117	307,556	87,248	480,304	52,091	130,326	8,713	212,223	445,295	92.7	35,009	16,013	—18,270	—23,777	11,009
	7 mos.	117	2,125,240	1,061,200	4,022,731	381,524	870,575	60,416	1,680,676	3,256,092	80.9	766,639	570,442	286,307	339,230	488,542
Rutland	July	407	183,063	31,846	276,065	53,220	55,606	11,193	135,673	270,957	98.1	5,108	—14,991	—17,443	—6,487	—6,306
	7 mos.	407	1,235,871	208,348	1,832,967	310,122	390,193	75,994	942,551	1,820,504	99.3	12,463	—125,833	—112,047	—12,720	—34,027
St. Louis-San Francisco	July	4,937	3,075,011	241,811	3,594,326	602,979	885,318	109,297	1,266,448	3,022,039	84.1	572,287	334,064	290,768	227,803	552,660
	7 mos.	5,014	18,582,589	1,436,802	22,139,862	4,232,668	5,723,240	709,964	8,733,505	20,216,912	91.3	1,922,950	247,242	116,547	2,098,194	1,940,236
Ft. Worth & Rio Grande	July	233	29,932	1,194	37,027	11,671	10,156	2,592	23,323	51,459	139.0	—14,432	—18,862	—24,138	—22,642	—21,300
	7 mos.	233	185,687	7,988	236,654	78,382	68,129	17,637	160,587	343,245	145.0	—106,591	—134,974	—168,797	—171,772	—148,839
St. Louis, San Francisco & Texas	July	261	91,187	806	95,285	36,755	20,306	4,674	42,052	110,868	116.4	—15,583	—19,916	—45,193	—34,920	—38,348
	7 mos.	261	521,973	3,616	549,167	219,726	114,270	33,861	272,103	679,165	123.7	—129,998	—156,790	—326,140	—276,759	—286,246
St. Louis Southwestern Lines	July	1,786	1,210,041	19,014	1,284,018	150,116	155,997	71,835	429,078	875,357	68.2	408,661	328,289	161,493	262,787	212,125
	7 mos.	1,786	8,594,982	110,125	9,089,234	1,031,930	1,210,790	504,536	3,007,168	6,217,243	68.4	2,871,991	2,362,645	1,401,087	1,363,836	1,764,607
San Diego & Arizona Eastern	July	155	35,462	10,250	50,363	10,031	6,459	1,888	21,335	45,132	89.6	5,231	2,952	3,818	—1,950	6,397
	7 mos.	155	234,384	44,489	291,873	76,234	53,055	13,245	137,433	316,154	108.3	—24,281	—45,564	—39,290	1,247	—22,334

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"A STITCH IN TIME"

ON a single track line without permissive wayside signals, a misunderstanding of orders occurred. Two passenger trains, approaching each other, passed the leaving signals at their respective stations simultaneously, an extremely rare occurrence. » » » » »

NO, there was no head-on, because both locomotives were equipped with "Union" Continuous Cab Signals and train control! The cab signals gave warning of this dangerous condition in time for both enginemen to bring their trains under control. » » » » » » »

"Union" Cab Signals, *continuously* controlled and constantly visible, give the engineman a continuous indication of conditions ahead. » » » » » »

Ask our nearest district office for details about the many operating and economic advantages of this modern signal.

997

1881 **Union Switch & Signal Co.** 1935

SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1935—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: After depr.& retir. 1935	After depr.& retir. 1934	Before depr.& ret.
Seaboard Air Line	July	4,307	$1,800,664	$226,539	$2,214,831	$433,671	$637,718	$140,837	$1,015,458	$2,390,026	107.9	—$175,195	—$336,969	—$339,141	—$212,519	—$181,816
	7 mos.	4,307	15,922,107	2,167,272	20,295,839	2,951,806	4,213,126	980,778	7,706,390	16,774,557	82.6	3,521,282	1,948,692	1,350,926	1,621,855	2,442,375
Southern Ry.	July	6,644	5,356,657	701,076	6,633,994	893,415	1,344,006	150,412	2,474,553	5,162,307	77.8	1,471,687	1,039,382	805,892	583,007	1,089,472
	7 mos.	6,644	37,173,980	4,561,625	46,097,860	6,017,715	8,891,134	1,020,087	17,454,763	35,451,287	76.9	10,646,573	7,635,418	6,257,546	7,345,097	7,948,909
Alabama Great Southern	July	315	347,787	50,522	428,619	94,563	102,461	12,408	146,738	374,389	87.3	54,230	49,750	40,243	39,504	64,005
	7 mos.	315	2,351,768	291,492	2,881,084	623,325	704,905	75,014	1,005,703	2,535,038	88.0	346,046	195,511	115,728	388,161	255,194
Cinn., New Orleans & Texas Pacific	July	336	1,121,171	67,302	1,247,170	186,315	212,576	25,117	316,596	780,508	62.6	466,662	400,133	370,125	326,945	419,594
	7 mos.	336	6,737,206	458,596	7,653,902	1,213,117	1,393,872	169,947	2,008,697	5,080,974	66.4	2,572,928	2,126,744	1,874,665	2,131,467	2,138,975
Georgia Southern & Florida	July	397	125,538	22,303	161,709	32,203	35,741	1,701	72,907	147,212	91.0	14,497	1,896	2,420	21,132	9,679
	7 mos.	397	796,807	184,102	1,107,771	217,027	229,746	12,438	506,163	999,281	90.2	108,490	19,735	12,201	90,512	56,712
New Orleans & Northeastern	July	204	163,906	19,309	196,488	26,323	34,679	6,245	66,227	143,716	73.1	52,772	30,431	17,541	7,932	23,771
	7 mos.	204	1,075,851	117,813	1,295,862	191,958	239,227	38,625	455,842	996,812	76.9	299,050	140,542	60,502	41,758	99,530
Northern Alabama	July	99	26,352	1,894	29,874	8,774	1,393	1,217	14,101	27,216	91.1	2,658	—1,246	—11,221	—471	—11,142
	7 mos.	99	297,022	11,448	321,154	67,627	9,786	8,315	113,243	211,028	65.7	110,126	83,847	—1,277	15,729	—817
Southern Pacific	July	8,786	8,301,517	1,672,710	10,944,876	939,209	1,808,047	299,510	3,965,585	7,780,653	71.1	3,164,223	2,203,992	1,663,951	2,228,779	2,144,197
	7 mos.	8,790	51,175,924	9,937,465	67,808,474	6,084,510	12,095,350	2,063,354	25,447,228	50,852,463	75.0	16,956,011	11,218,012	8,518,247	9,287,592	11,705,865
So. Pac. Steamship Lines	July	....	346,280	28,790	385,734	15,296	87,603	15,769	309,380	446,002	115.6	—60,268	—60,976	—61,108	—70,498	—25,857
	7 mos.	....	2,549,130	94,936	2,724,266	96,430	614,661	111,825	2,137,356	3,085,788	113.3	—361,522	—367,857	—368,781	—455,406	—124,151
Texas & New Orleans	July	4,434	2,044,235	272,461	2,651,879	449,598	571,432	112,573	1,063,034	2,419,693	91.2	232,186	42,425	—169,644	—281,829	25,851
	7 mos.	4,440	15,164,831	1,577,753	19,103,247	2,714,193	3,743,278	803,344	7,216,622	16,029,030	83.9	3,074,217	1,570,766	187,324	—539,258	1,157,534
Spokane, Portland & Seattle	July	552	469,447	52,217	556,736	52,100	64,615	7,684	162,058	303,343	54.5	253,393	198,460	170,994	68,798	185,670
	7 mos.	552	2,756,457	279,664	3,270,328	281,143	437,831	44,018	1,074,646	1,913,794	58.5	1,356,534	997,266	846,098	785,819	945,849
Tennessee Central	July	286	159,100	5,646	174,805	27,070	23,785	5,236	58,090	116,257	66.5	58,548	52,885	41,254	34,761	46,893
	7 mos.	286	1,126,979	35,703	1,234,259	205,696	181,240	35,283	431,730	902,602	73.1	331,657	301,819	215,379	208,096	255,039
Texas & Pacific	July	1,949	1,655,668	197,922	2,055,063	205,197	341,812	70,542	606,626	1,352,282	65.8	702,781	597,717	453,984	409,035	554,879
	7 mos.	1,949	10,357,803	1,134,245	13,035,011	1,358,190	2,392,406	485,864	4,061,578	9,179,523	70.4	3,855,488	3,141,719	2,390,709	2,600,349	3,095,563
Texas Mexican	July	162	66,824	411	77,741	13,107	14,174	3,534	30,669	69,385	89.3	8,356	4,253	—202	1,027	1,777
	7 mos.	162	652,063	2,646	731,150	100,685	99,998	22,203	237,041	503,808	68.9	227,342	198,298	150,126	57,397	163,979
Toledo, Peoria & Western	July	239	150,468	5	153,447	44,220	11,734	15,950	39,614	120,883	78.8	32,564	28,601	15,253	23,555	17,592
	7 mos.	239	946,873	136	962,915	286,565	70,674	104,939	264,132	787,021	81.7	175,894	151,814	58,885	67,221	74,820
Union Pacific	July	3,589	4,513,708	652,081	5,700,145	1,183,039	1,335,478	137,549	1,870,482	4,712,659	82.7	987,486	270,149	14,187	1,169,866	356,004
	7 mos.	3,595	29,635,676	3,289,026	36,519,791	4,783,520	8,736,873	960,741	12,489,405	29,084,908	79.6	7,434,883	4,247,178	2,788,019	5,308,303	5,135,403
Oregon Short Line	July	2,504	1,446,803	171,116	1,761,949	247,449	301,177	37,402	630,433	1,266,039	71.9	495,910	319,196	246,217	44,305	321,040
	7 mos.	2,504	10,213,447	773,188	11,909,564	1,783,833	2,120,616	259,451	4,140,815	8,943,524	75.1	2,966,040	1,455,560	929,679	884,382	1,509,722
Oregon, Wabash R. R. & Nav. Co.	July	2,271	1,073,591	140,316	1,354,892	242,416	198,452	54,888	524,480	1,052,727	77.7	302,165	174,057	78,855	—636	123,111
	7 mos.	2,281	6,773,504	759,131	8,438,659	1,595,627	1,318,291	377,750	3,491,315	7,293,176	86.4	1,145,483	266,610	—372,091	—148,696	—30,386
Los Angeles & Salt Lake	July	1,234	1,074,981	229,029	1,435,489	149,503	219,287	53,640	440,552	934,396	65.1	501,093	409,486	304,301	307,096	360,260
	7 mos.	1,234	7,593,259	1,096,505	9,495,711	1,182,304	1,551,815	362,290	2,958,313	6,619,636	69.7	2,876,075	2,093,611	1,348,626	1,710,483	1,786,174
St. Joseph & Grand Island	July	258	183,376	3,985	193,973	53,273	20,991	2,893	72,448	154,729	79.8	39,244	85,426	55,228	24,220	58,897
	7 mos.	258	1,409,485	15,510	1,480,394	302,191	152,079	17,700	501,698	1,045,205	70.6	435,189	400,775	225,135	325,051	250,927
Utah	July	111	39,858	.....	40,020	13,610	18,284	525	10,646	47,445	118.6	—7,425	—12,150	—12,827	—22,732	—5,930
	7 mos.	111	481,884	.....	483,828	83,202	141,439	3,560	117,042	380,061	78.6	103,767	38,012	12,205	—100,364	60,477
Virginian	July	619	1,216,102	3,631	1,264,216	118,339	219,877	17,635	226,722	608,018	48.1	656,198	506,197	557,766	524,896	642,705
	7 mos.	619	8,534,980	21,719	8,907,505	697,842	1,561,134	122,339	1,612,168	4,181,433	46.9	4,726,072	3,641,017	3,930,646	3,666,819	4,525,414
Wabash	July	2,447	2,861,609	191,449	3,245,965	449,190	538,162	141,469	1,277,479	2,561,113	78.9	684,852	549,949	231,952	306,777	.....
	7 mos.	2,447	20,745,770	1,210,879	23,550,195	2,705,960	4,019,905	982,822	9,213,681	18,031,138	76.6	5,519,057	4,571,250	2,459,086	2,673,225	.....
Ann Arbor	July	293	316,235	3,070	336,467	31,352	72,677	12,744	124,198	255,239	75.9	81,228	67,547	43,405	43,920	64,126
	7 mos.	293	2,135,227	17,417	2,216,542	181,019	466,255	80,920	891,498	1,710,582	77.2	505,960	410,831	272,150	234,116	417,223
Western Maryland	July	883	1,020,501	8,703	1,062,638	155,584	218,738	36,109	282,381	749,820	70.6	312,818	252,818	274,999	291,435	374,690
	7 mos.	883	8,168,748	46,041	8,490,947	1,081,125	2,091,077	257,377	2,199,165	5,998,234	70.6	2,492,713	2,072,713	2,259,265	2,390,710	2,960,213
Western Pacific	July	1,213	856,897	60,498	880,659	242,884	184,498	63,137	391,170	863,348	98.0	17,311	—8,780	—51,791	185,058	—6,778
	7 mos.	1,213	5,837,114	195,571	6,228,544	1,224,086	1,187,964	394,946	2,666,245	5,670,821	91.0	557,723	143,370	—53,943	598,833	260,843
Wheeling & Lake Erie	July	511	926,861	1,424	992,272	147,975	264,995	29,542	310,619	780,885	78.7	211,387	137,878	149,815	73,519	252,636
	7 mos.	511	7,032,543	9,370	7,446,044	1,030,575	2,135,914	211,469	2,213,620	5,790,029	77.8	1,656,015	1,090,751	1,077,401	1,103,069	1,795,045
Wichita Falls & Southern	July	203	46,775	33	54,148	7,072	6,820	1,842	13,393	32,014	59.12	22,134	19,773	17,483	3,606	19,952
	7 mos.	203	272,402	281	304,594	56,114	46,054	12,374	92,974	230,891	75.80	73,703	57,901	39,122	40,424	56,408